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HORTUS

A CONCISE DICTIONARY OF GARDENING AND GENERAL HORTICULTURE

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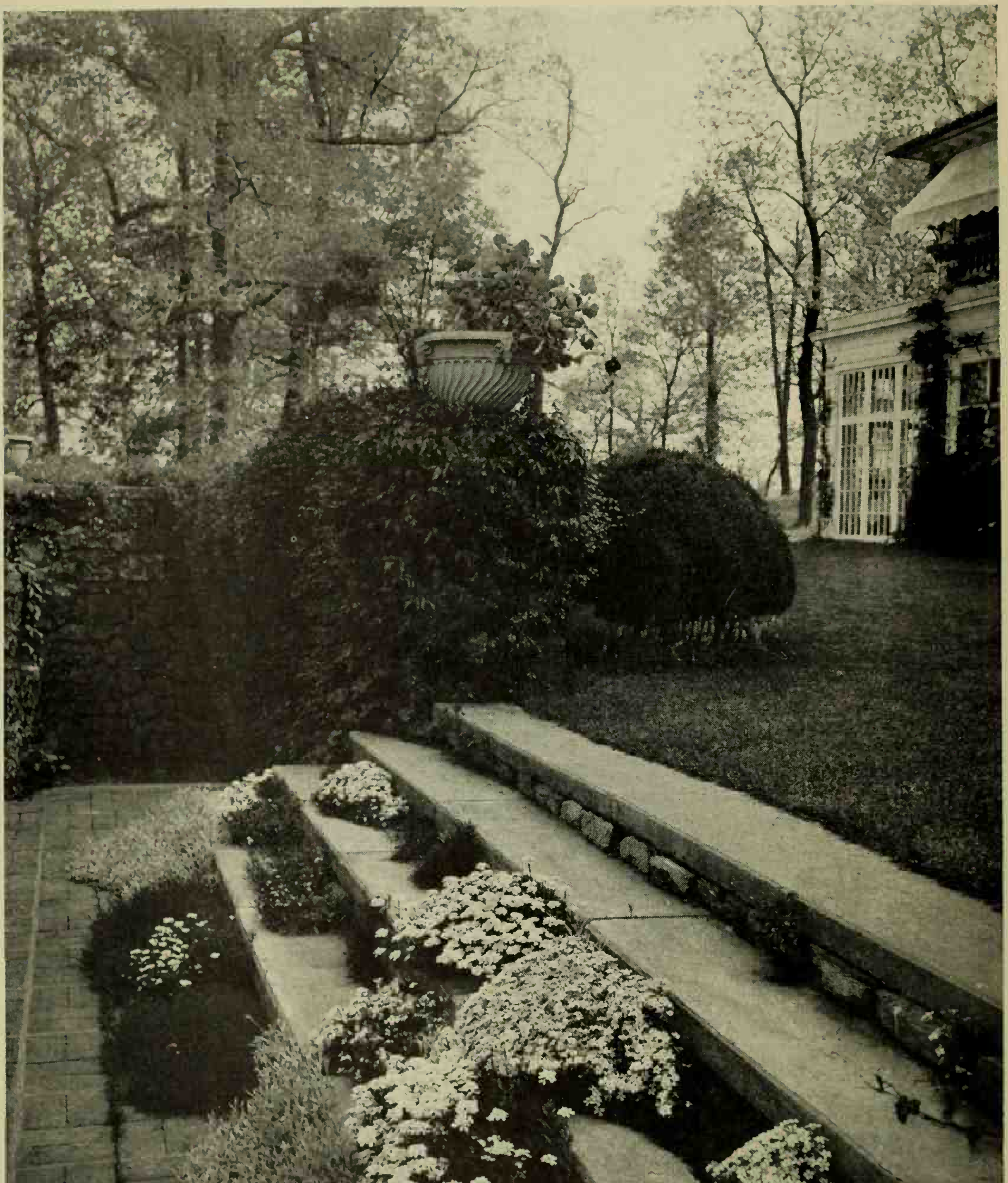

I. Entrance to the garden level. — An interesting welcome of springtime

HORTUS

A CONCISE DICTIONARY
of
Gardening, General Horticulture and Cultivated Plants in North America

Compiled by L. H. BAILEY
and ETHEL ZOE BAILEY

THE MACMILLAN COMPANY
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HORTUS

This book is an annotated inventory of the species of plants and their main botanical varieties now in cultivation in the United States and Canada outside botanic gardens, experiment stations, government test grounds, special fancier's collections, and introduction gardens, together with brief indications of uses and methods of cultivation.

* * * * *

To be aware of all the plants that may be in cultivation within the country is manifestly impossible inasmuch as there is no recording agency of them. The present accounting is founded on the catalogues of plant and seed dealers, entries in books and current literature of North American origin, lists available for exchange and distribution, correspondence, together with observations and botanical collecting in many gardens and plantations in widely separated regions; it aims to cover the species now in regular cultivation somewhere within the vast region north of the Rio Grande or potentially available for general distribution or that are charged with public interest as cultivated subjects. Special care has been taken to discover the cultivated herbaceous plants inasmuch as they do not receive equal attention with trees and shrubs and their identities are not so well established since they are readily distributed by seeds and are likely to be fugitive. The inventory does not include plants that the Editors think ought to be in cultivation, nor does the inclusion of a plant imply any recommendation of it.

Although the annotations must be exceedingly brief under each entry, it is hoped that the volume will be useful as a handbook of ready reference providing an aid to current nomenclature and to the spelling of the names, a present help in labeling, a body of suggestions on the main requirements in cultivation, and a compact register of contemporaneous resources in plant materials. Persons desiring fuller descriptions of the species and more information are referred to the current manuals and floras of native plants, to the Standard Cyclopedia of Horticulture, to Bailey's Manual of Cultivated Plants, and to Rehder's Manual of Cultivated Trees and Shrubs; and more details on cultivation are to be found in the periodicals and in various gardening books and bulletins. The book is intended to supply sufficient information under each genus and species to meet the main requirements of the planter; in certain groups of special difficulty for which recent manuals or monographs are not available, regular brief description is provided to guide the consultant in identification. The consultant must naturally use all information on his own responsibility.

Named horticultural varieties, whether of apples, roses, irises, dahlias, tomatoes, strawberries, or other domesticated groups, are naturally not treated or catalogued in this work although a few of them may be mentioned in the cultural articles. Accounts of these varieties are to be found in special books and bulletins and in the publications of societies. Current varieties in all the groups are listed in Standardized Plant Names, compiled and published by the American Joint Committee on Horticultural Nomenclature, together with scientific and common names of plants in North American commerce approved for purposes of practical convenience in the horticultural trades.

Not all the plants entered in this book may be in cultivation in the country at any moment, and the Editors do not undertake to advise where seeds or roots of them may be obtained. In recent time very many species are introduced as seeds, and the kinds may not find permanent favor or be adapted to the country. The population of gardens undergoes change and shift. The book is a summary, as complete within its scope as the Editors are now able to make it but nevertheless reflecting the imperfections of our knowledge of the North American cultivated flora. Real records of cultivated plants, as of wild ones, are the plants themselves competently preserved in herbaria, but such records sufficient for conclusive study as a whole do not exist.

In a compilation of this kind it is obvious that precision and completeness are unattainable. One cannot be certain of the identity of all the botanical names in lists and periodicals. In many cases the plants themselves are not available and the only recourse is to describe the species so named; whether the plant grown under the name was correctly determined will be discovered in due time when specimens of it are procurable for study. Frequently the name has no botanical standing; it is then entered as a listed or trade name and its identity must await future effort.

* * * * *

The nomenclature follows the system of the International Rules of 1905 and 1910. The Editors have not undertaken to harmonize the names of plants coming from all parts of the world but have adopted the usage of standard works and other studies. In many genera the species from different countries may be here placed in juxtaposition for the first time, and as the nomenclature and judgments on species follow different authors so may the names not represent comparable treatment; but it is clearly not the office of this volume to make arbitrary changes. Likewise the brief annotations must often follow authentic descriptions without plain contrast of one species with another. The harmonizing of diagnoses and the unification of nomenclature must be the result of monographic studies of special investigators as the years pass.

The Editors do not necessarily approve either segregation or amalgamation of genera because of the entry of them in this book: they adopt what seems to them to be the most feasible present policy in doubtful cases, reserving full right of action for other occasions or in the event of critical study of the groups. For example, because new generic names may be here reduced to the rank of synonyms, it does not follow that the Editors definitely discard such names but only that for horticultural purposes a more conservative course may be advisable until such time as the common opinion of botanists passes judgment; and on the other hand when old genera or groups are broken up into several or many, it is not to be understood that thereby the Editors pronounce on the botanical validity of the segregations. Division of a widespread genus that is split only as to the species of one country, as of North America, cannot be adopted in this book if the species of other countries are to be entered, for those species may not have been transferred.

It is incumbent on a book of this kind to follow an accepted system of botanical nomenclature. The Latin names of plants have arisen from more than two centuries of trial and practice. They represent a technical language controlled by carefully constituted rules formulated as the result of the work of masters and the agreements of discussion in conference. The subject is technical and complex. It involves problems of history, usage, and biology. Regularly constituted international scientific agencies provide direction and sit as courts of decision.

The primary interest in nomenclature is not stability or invariability but representation of the facts and the making of printed records. In recent time the changes in names have been extensive because of the necessity to expand the rules to represent the enlarging studies of plants. The formal alterations may be expected to become fewer, but other changes must always follow new conclusions in biological study. Much of the confusion in names of cultivated plants arises from the frequent practice of growers and cataloguers in using varietal and specific names interchangeably or in failing to distinguish the two categories, and also in applying Latin names to incidental or horticultural variations; until these habits or practices are corrected there is little hope of attaining clarity in horticultural systematic nomenclature. The aim of nomenclature is to present the state of knowledge accurately and to eliminate confusion in conceptions of genera, species and varieties.

* * * * *

A statement is required on the orthography of generic names. It is to be understood that by the common consent of mankind, the botanical names of plants are to be Latin or Latinized. This is the only language adaptable to such formal usage, and it is common to botanists throughout the world. All rules and practices of technical botanical nomenclature issue from this premise.

The Rules require that names in botanical nomenclature retain their original spelling but that terminal syllables of species-names are to be modified to correspond with the gender of the generic name to which they are attached: thus the Latin *albus* (white) retains its masculine ending when associated with a masculine generic name, as *Lupinus albus*, but becomes feminine in *Brassica alba* and neuter in *Sedum album*.

It is not allowable, however, to modify the structure of either generic or specific names, after they are once published, to make them correct in etymology. We have seen that many of the names are very old and they have become imbedded in the language of nomenclature. If an effort were made to change them to satisfy exact rules of philological construction it would lead to great and unnecessary confusion. The rules of nomenclature are clear on this point. The International Rules assert that generic names "may be taken from any source whatever and may even be composed in an absolutely arbitrary manner"; and again, "the original spelling of a name must be retained, except in case of a typographic or orthographic error." The American Code states that "the original orthography of names is to be maintained," except that "manifest typographical errors may be corrected." Thus the palm *Serenoa* was first printed as *Serenæa* but the name was corrected by the author in the addendum of the same volume and the corrected spelling is to hold. Had Hooker intended to Latinize it as Serenæa, the name would have to stand in that form even though made for Sereno Watson. The author has the choice and the right to his own orthography, and it is not permissible to change it; he does not commit an error in exercising this privilege. Another illustration is *Dion.* The name was so published by Lindley in 1843, the Greek derivation being given; the name was repeated by him in his great work, "The Vegetable Kingdom," 1846. Subsequent authors "corrected" the name to Dioon, to correspond with the Greek elements (two-egged); this makes a word of three vowel syllables, and it was probably to avoid this difficulty that Lindley took pains to limit the vowels to two: he did not make a mistake and the name was not a misprint. The current edition of Webster's New International Dictionary adopts the original short spelling.

Although a generic name is based on a Latin or Greek root or suggested by such a root, or on a personal, geographic or other word more or less Latinized, the author of it is not obliged to follow the orthography of the original word or name on which he founded it. A name is a name quite independently of its etymology or origin and answers all the purposes of nomenclature, the more acceptable the more nearly it conforms to Latin usage. No one objects to *Arabis* because it does not follow exactly the name of Arabia which suggested it, and everyone is happy that *Triosteum* is a condensation of *Triosteospermum* and that *Tecoma* is separated from the full Mexican word *Tecomaxochitl.* It does not matter that *Agrimonia* is a corruption of *Argemone*, that *Asimina* is constructed from the French *Asiminier*, *Specularia* from *Speculum Veneris*, *Verbesina* said to be metamorphosed from *Verbena*, and that *Solidago* has only irregular relation with the Latin *solidare.*

The same attitude holds for generic words made from personal names. Botanical names are not primarily commemorative, and an author is under no greater obligation to adopt the exact orthography of a personal name than of a Latin, Greek, geographic or barbaric word. Nuttall had the privilege to write *Wisteria* although named, as he says "in memory of Caspar Wistar" (a family name, however, sometimes written Wister); he perhaps thought the word to be more euphonius Latin when spelled with an *e.* It is equally a compliment to the man. Similarly, Gaudichaud had the right to coin the name *Pernettia* although made for Pernetty, inasmuch as there is no original *y* in Latin; Pernetty himself would not have written his name with *y* if he had used it in a Latin dissertation. We understand why Robert Brown made the genus *Mathiola* in honor of Matthioli, apparently to avoid the undesirable *tt;* we have evidence that this spelling was intentional. There is, to be sure, another generic name spelled *Matthiola* which is not in use; if this other name is validated, Brown's may have to disappear; but as long as Mathiola holds for a cruciferous genus it should be spelled as Brown intended. Another case is Brown's *Malcomia*, named for Malcolm, but the second *l* is silent and was not transferred to the Latin nomen. We cannot regret *Plumeria* named for Plumier, *Gleditsia* for Gleditsch, *Mahonia* for M'Mahon, *Fontanesia* for Desfontaines, *Hamelia* for Duhamel, *Stranvæsia* for Fox-Strangways, and any number more.

A case in point is *Buginvillæa*. The name was published in this spelling by Jussieu in 1789. He adds that the plant was named for De Bougainville, and it is accredited to Commerson, these men having been associated in a circumnavigating expedition. In the list of errata at the end of the book there is no correction of the word. It is clear that the spelling *Buginvillæa* was intentional. The reason for this orthography is apparent: the authors chose to make a Latin word of it, and the elements *ou* and *ai* are unfamiliar in that language. We have no reason to object to the name as Commerson and Jussieu wrote it, when DeBougainville was still living, and we have no authority to change it to correspond to the form in French and thence in English. Ten spellings of this generic name by standard botanical authors are in the cited literature, among them being *Buginvillea*, *Buginvillæa*, *Buginvillia*, *Bugenvillea*, *Buguinvillea*, *Bougainvillæa:* the only satisfactory course is to go back to the original orthography, particularly as the word was properly constructed at that time.

* * * * *

A volume of this kind has been in prospect for twenty-five years or more. Ever since the completion of the Cyclopedia of American Horticulture in 1902 the hope has been entertained that a one-volume cyclopedia would some day be possible. The problem of keeping account of the species of plants newly introduced and of presenting the results of new systematic studies so far as they are expressed in the limits of genera, definitions of species and in nomenclature, has been an ever-present responsibility. This was acknowledged in the preface to the first Cyclopedia, written January 11, 1902: "It is hoped that subsequent progress may be recorded in annual supplemental volumes. It is planned to issue each year a supplement of say 75 to 100 pages, in the same size of page as the present book, with cumulative index, in paper covers: every five years these supplements may be completed into a volume." The effort began in a small way even earlier than this, in the five volumes of the Annals of Horticulture, covering the years 1889 to 1893. The supplements did not appear. Subsequently the Standard Cyclopedia of Horticulture was prepared as an enlargement of the subject, and was published in six volumes in the years 1914 to 1917, and later on thin paper in three volumes.

This volume is not assembled from the Standard Cyclopedia of Horticulture in the sense of being merely an epitome or abridgement of that work. It is a new undertaking, compiled as far as possible from fresh and original sources, to express the status of American horticulture at this period as reflected in the species of plants at the command of the cultivator. It has been in preparation about five years. The Standard Cyclopedia remains the basis, and the present book is a supplement to it, carrying out the hope that was expressed on the completion of the first work in 1902 and which has been under discussion between publisher and editor for many years. It is one more stage in the effort to represent American plant-growing as a living changing subject, and to stress the importance of clear identification of plants without which the highest type of horticulture is unattainable.

Hope is not abandoned that a way will be found whereby a recognized continuing effort may be developed to keep account of the cultivated flora, for the plants that men and women gather about them are a primary source of enjoyment and wealth and are more than ever needed as the material assets of life multiply. At stated intervals a new inventory should be published together with a review of the progress in plant knowledge in the intervening years. The Editors feel that a clear responsibility rests on plant lovers and horticulturists to communicate records of plants in cultivation in their respective regions; there is no other way by which the territory and the subject can be satisfactorily covered.

* * * * *

It is a peculiar pleasure to bring to North America the word Hortus as the name of a book. In such usage it has long and illustrious history. Latin for "a garden," the word is also employed for a book about the plants that grow in the garden and sometimes for a work about the kinds of plants in general. It is needless to trace the history of the usage, but a few citations will serve as illustrations. For our purposes we may well begin with the great Hortus Eystettensis of Besler in 1613, most ponderous of horticultural books when bound in its single volume; it describes and illustrates the plants that grew in the Eystadt garden in Bavaria, seat of a German prince-archbishop. Contemporaneous with the Besler, on or about the year 1614, the illustrious Hortus Floridus was published in Utrecht, by Crispin vande Pass; part of this famous book has been reproduced recently in England. Long before these dates, however, the anonymous Ortus Sanitatis, or "Garden of Health," had appeared. Different manuscripts of it exist, and various printed editions that comprise an important part of the early examples of the printer's art. The Hortus Malabaricus of Rheede, published in Amsterdam, 1686–1703, runs to twelve folio volumes; it is Hortus indicus malabaricus, describing plants of the western or Malabar coast of British India, and is one of the noted early works but not horticultural. Hortus Elthamensis was published in London in 1732, prepared by Dillenius, professor in Oxford, who once lived at Eltham and who made etchings of plants in the Sherard garden; it has become a famous reference. Two hortuses by Linnæus are of commanding importance because of their bearing on the identification of the species described in his subsequent works: one is Hortus Cliffortianus, 1737, covering the plants grown in the garden of George Clifford in Holland; the other is Hortus Upsaliensis, 1748, giving an account of the plants in his garden at Upsala. Subsequent hortuses became of great consequence in the establishing of the science of systematic botany, of which a few may be mentioned: Jacquin, Hortus Botanicus Vindobonensis, three folio volumes, 1770–1776, describing plants in the botanic garden in the city known in Latin as Vindobona and in English as Vienna; Aiton, Hortus Kewensis, 1789, a catalogue of the plants cultivated in the Royal Botanic Garden at Kew, England, in three volumes, with a second edition of five volumes in 1810–1813; Willdenow, Hortus Berolinensis, published in folio parts beginning 1806, at Berlin; Roxburgh, Hortus Bengalensis, a catalogue of the plants growing in the botanic garden in Calcutta, 1814. Mention should be made of Titford, "Sketches towards a Hortus botanicus americanus" that appeared in London in 1811, although it is not a hortus in the present sense; it deals mostly with Jamaican plants; and Lunan published his Hortus jamaicensis in Jamaica in 1814. Hortuses of a more distinctly horticultural character began to appear early in the past century, as: Robert Sweet, Hortus Suburbanus Londinensis, a catalogue of plants cultivated near London, 1818, followed in 1826–27 by his well-known Hortus Britannicus accounting for the plants cultivated in the gardens of Great Britain; Stephen Clarke, Hortus Anglicus, 1832, or the "modern English garden"; John Claudius Loudon, Hortus Britannicus, 1830 and subsequent editions, still a useful work of reference for gardeners. In later years the word Hortus has been less employed in book titles, although Hortus Vilmorinianus, a catalogue of all the plants in the collections of Philippe L. de Vilmorin and of Vilmorin-Andrieux et Cie, France, dates from 1906, and Hortus Mortolensis, compiled by Alwin Berger of the plants in the Hanbury gardens, La Mortola, in Italy, was published in 1912. In the western hemisphere, Hortus Fluminensis by Barbosa Rodrigues was published in 1894 or 1895, containing accounts of the plants cultivated in the Botanic Garden at Rio de Janeiro.

These various titles sufficiently testify to the significance of the word Hortus and indicate the character of its usage. There is no other available word that quite so well covers the attempt to compile a descriptive document of the plants in cultivation in a given time or place or region. The present work is a Hortus Americanus.

L. H. BAILEY.

Ithaca, N. Y.
Jan. 1, 1930.

Approximate statistics of Hortus are as follows:

1. Captions.	Main separate articles (in **LARGE CAPITALS**)	2,881	
	Secondary entries (in **SMALL CAPITALS**), including definitions, vernacular names, cross-references (but not all the cross-references in paragraphs)	2,409	
			5,290
2. Genera.	Captions that are technical generic names (in **LARGE CAPITALS**): genera accounted for		2,519
3. Species.	Number of species and independent species-names, aside from synonyms, regularly entered in **black small type**		12,659
4. Synonyms.	Species-names regularly entered as determined synonyms in **black small type**		3,987
5. Varieties.	Latin varietal names (vars.) in **black small type** (not vernacular names)		3,102
	Total Latin binomials and trinomials (in **black small type**) formally accounted for, aside from many secondary and subordinate accountings		19,748

Abbreviations and elisions are necessary to the great condensation required in a work of this character. Aside from the usual abbreviations for countries, states and provinces, those employed in this volume are as follows:

ann	annual
bien	biennial
caps	capsule
cent	central
cult	cultivated, cultivation
diam	diameter
E	East, eastern: E. U. S., Eastern United States; N. E. U. S., Northeastern United States.
fl	flower
fld	flowered
fls	flowers
fr	fruit
frs	fruits
ft	foot, feet
hort	horticulture, horticultural
in	inch, inches
infl	inflorescence
intro	introduced
isl., isls	island, islands
lf	leaf
lft	leaflet
lfts	leaflets
lvs	leaves
mts	mountains
N	North, northern: N. N. Amer., Northern North America; N. S. Amer., Northern South America; N. Eu., Northern Europe
nat	naturalized
per	perennial
S	South, Southern: S. S. Amer., Southern South America; S. Calif., Southern California; S. W. U. S., Southwestern United States
segm., segms	segment, segments
st., sts	stem, stems
subtrop	subtropical
temp	temperate (zone or region)
trop	tropical
var	variety (of a species)
W	West

Dimensions of stature, as well as of flowers and leaves, are stated for the information of the planter in choosing his material, not as botanical measurements. General outside normal sizes are commonly given for greatest brevity and also as most significant to the horticulturist: "to 8 in." means that the plant attains to that height under the usual conditions of its growth in the wild and in favorable circumstances, although it may not always actually reach it; "to 3 in. long" implies that the principal leaves or parts commonly attain to that length. Dimensions of leaves apply to the leaf-blade and do not include the petiole unless so stated; in grasses and similar plants they do not cover the leaf-sheath. Naturally, all these figures can be only approximate and are subject to variation. In the main horticultural species, there may be marked stature-forms, as dwarfs, talls, and giants.

Pronunciation of botanical names is indicated in all cases in the Standard Cyclopedia of Horticulture, of all genera in regular sequence in the Manual of Cultivated Plants and of species-names on pages 21-36 of that work, of both genera and species in Rehder's Manual of Cultivated Trees and Shrubs, and similarly in the manuals and floras of native plants. It is not necessary to repeat these technicalities in this plain book. Experience shows, however, that a few cautions and suggestions are necessary. The consultor is reminded that every vowel or vowel-element indicates a syllable to be separately pronounced, as

Rì-bes, Hè-be: two elements or syllables.

Nerì-ne, Helxì-ne, Agà-ve, Sém-ele, Silè-ne: three syllables.

Cardám-ine, Lirì-ope, Cordylì-ne: four syllables.

Hydrocót-yle: five syllables.

edù-le, acaù-le, commù-ne, vulgà-re, lóng-ipes, vír-ide, bivál-ve: three syllables.

canadén-se, barbinò-de, capillà-re: four syllables.

officinà-le, catawbién-se, occidentà-le: five syllables.

Ligatured letters, as æ, œ, are one element or sound, pronounced usually as e; when not ligatured these elements constitute two letters or syllables:

Æs-culus: three syllables.
Aer-ides: four syllables, as in *aeroplane.*
Œnothe-ra: four syllables.

Acknowledgment is due to many persons in many places who have aided by counsel and suggestions in the preparation of this Hortus, and whose names are so many that they cannot be listed here and particularly as the articles are printed on the responsibility of the Editors. The manuscripts of many genera have been examined carefully by specialists in the groups, and all the ferns, grasses, figworts, orchids, iris, mesembryanthemums, many of the orpines, and other associations have been in the hands of recognized authorities. Many practical and cultural directions have been supplied by experienced persons. This hearty cooperation has been one of the best satisfactions in the long and close labor of authorship and compilation, and the Editors extend their gratitude.

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A

ABACÁ: *Musa textilis.*

ABELE: *Populus alba.*

ABELIA. *Caprifoliaceæ.* Attractive shrubs with persistent or deciduous simple opposite lvs. and numerous small white or pink tubular fls. in axillary or terminal cymes with persistent large purplish sepals, blooming in summer; native in Asia and Mex.

Abelias thrive in a well-drained soil, enriched with leaf-mold, and in a sunny preferably protected situation. *A. floribunda* is sometimes grown in the greenhouse. Propagated by greenwood cuttings rooted under glass in the summer, or by cuttings of ripe wood in autumn; seed is rarely employed. *A. grandiflora* and *A. Engleriana* are hardy North, and other species less hardy.

chinensis (*A. rupestris*). Deciduous shrub to 6 ft.: lvs. ovate, to 1½ in. long: fls. in dense terminal panicles, white, funnelform, ½ in. long, fragrant; sepals 5. China.—Plants grown under this name may be *A. grandiflora.*

Engleriana. Deciduous shrub to 6 ft.: lvs. ovate to oval-lanceolate, to 1½ in. long: fls. in few-fld. axillary clusters, rosy-purple or rosy-pink, funnelform, ¾ in. long; sepals 2. China.

floribunda. Mexican A. Evergreen shrub to 6 ft.: lvs. ovate, to 1½ in. long: fls. pendulous, solitary or in 2–3-fld. clusters, carmine-purple, tubular, 1½ in. long; sepals 5. Mex.

Graebneriana. Deciduous shrub to 10 ft.: lvs. ovate or narrowly so, to 2½ in. long, acuminate: fls. solitary or few on short side branchlets or axillary, pink, yellow inside. China.

grandiflora. Glossy A. Hybrid between *A. chinensis* and *A. uniflora:* half-evergreen shrub to 6 ft.: lvs. ovate, to 1½ in. long, shining: fls. in loose terminal panicles, white flushed pink, bell-shaped, ¾ in. long; sepals 2–5.—The common kind in cult.; often grown as *A. chinensis.*

rupestris: *A. chinensis,* but the plant in the trade is usually *A. grandiflora.*

Schumannii. Deciduous slender shrub to 5 ft. or more: lvs. ovate to elliptic, to about 1 in. long, mucronate but otherwise nearly obtuse: fls. several on short side growths, pink, corolla slender at base. China.

triflora. Deciduous shrub to 12 ft.: lvs. lanceolate or ovate-lanceolate, to 3 in. long: fls. in terminal clusters 2 in. across, rosy-white, salverform, ½ in. long; sepals 5. Himalayas.

uniflora. Interesting as one of the parents of *A. grandiflora:* evergreen, to 6 ft.: lvs. ovate, acuminate, shining above, to 1 in. long: fls. pinkish-white, orange in throat, 1 in. long; sepals 2. China.

ABELMOSCHUS: *Hibiscus.*

ABERIA: *Dovyalis.*

ABIES. Fir. *Pinaceæ.* Large evergreen trees 50 ft. and more in height and of pyramidal habit and continuous axis or trunk, having flat linear lvs. which are usually shiny above and with 2 white bands below, and erect cones with deciduous scales; native in the north temp. zone and hardy in cult. from the central regions north. Distinguished from the spruces (Picea) by the flat lvs. whitish beneath, erect cones with shedding scales. Although distinct to those who know them, the firs are difficult to separate by brief descriptions. For cult. see *Conifers.*

ajanensis: *Picea jezoensis.*

alba (*A. pectinata. A. Picea*). Silver F. Lvs. to 1¼ in. long, rounded and notched at apex: cones cylindric, to 5½ in. long, green turning reddish-brown. Cent. and S. Eu.; hardy in northeastern states, but likely to lose its lower branches there and to become thin. Var. **columnaris,** head columnar; var. **compacta,** dwarf and compact; var. **equi-trojani,** lvs. more pointed, cones oblong-cylindric; var. **pendula,** branches drooping; var. **pyramidalis,** head columnar.

amabilis. Cascade F. Lvs. about 1 in. long, notched or truncate at apex: cones oblong, to 6 in. long, purple. B. C. to Ore.; hardy in S. New England.

arizonica: *A. lasiocarpa* var.

baborensis: a synonym of *A. numidica.*

balsamea. Balsam F. Lvs. to 1 in. long, rounded or slightly notched at apex: cones oblong, to 2½ in. long, violet-purple. Lab. to W. Va. and Ia. Var. **hudsonia,** a dwarf form; var. **macrocarpa,** lvs. and cones longer; var. **phanerolepis,** bracts of cone exserted.

Beissneriana. Lvs. about 1 in. long: cones peduncled. W. China; probably hardy in north central states.

Borisii regis. Lvs. about 1 in. long, acute or sometimes notched at apex: cones cylindric, to 6 in. long. Balkan Peninsula.

Bornmuelleriana. Lvs. 1¼ in. long, rounded or notched at apex: cones cylindric, to 5 in. long. Asia Minor.

brachyphylla: *A. homolepis.*

canadensis: *Tsuga canadensis.*

caroliniana: *Tsuga caroliniana.*

cephalonica (*A. Reginæ-Amaliæ*). Greek F. Lvs. to 1 in. long, sharp-pointed: cones cylindric, to 7 in. long, brownish. Greece; hardy in S. New England. Var. **Apollinis** has thicker and broader less pointed lvs.

chensiensis. Lvs. to 1½ in. long, usually rounded and notched at apex: cones ovoid-oblong, to 4 in. long, green turning red-brown. Cent. China; can be grown in S. New England.

cilicica. Lvs. about 1 in. long, slightly notched at apex: cones cylindric, to 9 in. long, reddish-brown. Asia Minor, Syria; hardy in climates like S. New England and N. Y.

concolor. White F. Lvs. to 2 in. long, rounded or acute at apex: cones cylindric, to 5 in. long, greenish or purplish. Colo. to Mex.; hardy N. Var. **argentea,** lvs. silvery-white; var. **aurea,** lvs. golden-yellow when young; var. **brevifolia,** lvs. short and thick; var. **globosa,** habit globose; var. **Lowiana,** lvs. longer, notched at apex, Ore. to Calif.; var. **violacea,** lvs. bluish-white; var. **Wattezii,** lvs. pale yellowish becoming silvery-white.

Delavayi. Lvs. to 1 in. long, notched at apex, margins revolute: cones cylindric to oblong, to 3 in. long, violet-black. W. China; hardy in such climates as S. New England.

Fargesii. Lvs. to 1 in. long, notched at apex: cones ovoid-oblong, to 3 in. long, purple or red-brown. Cent. China; hardy S. New England but suffers in severe winters.

Faxoniana. Lvs. to 1 in. long, rounded or notched at apex, margins slightly revolute: cones ovoid-oblong, to 3 in. long, violet-purple. W. China; probably hardy in N. Y. and S. New England.

firma. Momi F. Lvs. to 1½ in. long, rounded and notched at apex, bands beneath inconspicuous: cones cylindric, to 5 in. long, yellowish-green. Japan; hardy in north central states and S. New England.

Forrestii. Lvs. to 1½ in. long, rounded or notched at apex: cones cylindric, to 4 in. long, violet-purple. W. China; somewhat tender N. E.

Fraseri (*Picea hudsonia*). Southern Balsam F. Lvs. to 1 in. long, rounded and notched at apex: cones oblong or ovoid, to 2¼ in. long, purple. Alleghany Mts.; hardy N.

Gordoniana: *A. grandis.*

grandis (*A. Gordoniana*). Giant F. Lvs. to 2¼ in. long, rounded and notched at apex: cones cylindric, to 4 in. long, bright green. Vancouver Isl. to Calif. and Mont.; to be grown in central states; in S. New England remains small.

holophylla. Needle F. Lvs. to 1½ in. long, rounded or acute at apex, spiny when young, bands beneath inconspicuous: cones cylindric, to 6 in. long, green becoming light brown. Manchuria, Korea; hardy N. Y. and New England.

homolepis (*A. brachyphylla*). Nikko F. Lvs. about 1 in. long, rounded and slightly notched at apex: cones cylindric, 4 in. long, purple. Japan; hardy in northern states. Var. **Tomomi**, less branched, lvs. shorter; var. **umbellata**, young cones green.

insignis. Hybrid between *A. Pinsapo* and *A. Nordmanniana.* Named vars. are **Beissneriana, Kentiana, Mastersiana,** and **speciosa.**

koreana. Lvs. to ¾ in. long, rounded and notched at apex, pointed when young, margins revolute: cones cylindric, to 3 in. long, violet-purple. Korea; hardy N. Y. and New England.

lasiocarpa (*Picea bifolia*). Alpine F. Lvs. to 1½ in. long, rounded or acute at apex, pale bluish-green: cones oblong-cylindric, to 4 in. long, purple. Alaska to New Mex. Var. **arizonica** (*A. arizonica*), Cork F., bark thick and corky; var. **compacta,** dwarf and compact.

magnifica. Red F. Lvs. 4-sided, to 1½ in. long, rounded at apex: cones cylindric-oblong, to 9 in. long, purplish-violet. Ore. to Calif.; hardy in parts of E. but needs shelter N. Var. **argentea,** lvs. bluish-white; var. **glauca,** Azure F., lvs. glaucous; var. **shastensis,** bracts of cone exserted.

Mariesii. Lvs. to ¾ in. long, rounded or notched at apex: cones ovoid to oblong, to 3½ in. long, dark purple. Japan; hardy N. Y. and New England.

nephrolepis. Very similar to *A. sibirica* but with shorter lvs. and smaller cones. Siberia, China; hardy in sheltered positions N. E.

nobilis. Noble F. Lvs. to 1½ in. long, rounded at apex, entire or slightly notched: cones cylindric-oblong, to 10 in. long, green becoming purplish-brown. Wash. to N. Calif.; not hardy throughout S. New England, and grows slowly. Var. **glauca** has glaucous lvs.; hardy.

Nordmanniana. Lvs. to 1½ in. long, rounded and notched at apex: cones cylindric, to 6 in. long, reddish-brown. Caucasus, Asia Minor, Greece; hardy and useful in northern states. Var. **aurea,** lvs. yellow; var. **tortifolia,** some of lvs. twisted.

numidica. Algerian F. Lvs. to ¾ in. long, rounded and slightly notched at apex: cones cylindric, to 7 in. long, purple. N. Afr.; grows in S. New England in sheltered places.

obovata: *Picea obovata.*

Omorika: *Picea Omorika.*

pectinata: *A. alba.*

Picea: *A. alba.*

Pindrow. Lvs. to 2⅓ in. long, acute and notched at apex, bands beneath inconspicuous: cones cylindric, to 5½ in. long, deep purple. Himalayas; hardy in central states.

Pinsapo. Spanish F. Lvs. to ¾ in. long, acute, thick and stiff, bands beneath inconspicuous: cones cylindric, to 5 in. long, purplish-brown. Spain; hardy in central states, also S. New England in sheltered positions. Var. **argentea,** lvs. silvery-white; var. **glauca,** lvs. glaucous; var. **pendula,** branches drooping.

recurvata. Lvs. to 1½ in. long, acute or sharp-pointed, bands beneath inconspicuous: cones oblong-ovoid, to 4 in. long, violet-purple becoming brownish. W. China; hardy in S. New England.

Reginæ-Amaliæ: *A. cephalonica.*

religiosa. Lvs. to 1¼ in. long, acute at apex: cones cylindric-oblong, to 6 in. long, violet-blue. Mex.

rubra: *Picea rubra.*

sachalinensis. Saghalin F. Lvs. to 1½ in. long, entire or slightly notched and rounded at apex: cones cylindric, to 3 in. long, greenish-purple. N. Japan, Saghalin; very hardy. Var. **nemorensis** has smaller cones.

sibirica. Lvs. to 1¼ in. long, rounded at apex, entire or notched: cones cylindric, to 3 in. long, bluish. N. Russia to Turkestan and Manchuria.—Sometimes suffers in hot dry summers.

spectabilis (*A. Webbiana*). Himalayan F. Lvs. to 2⅓ in. long, rounded or notched at apex: cones cylindric, to 7 in. long, violet-purple. Himalayas; hardy in central-southern regions. Var. **brevifolia** has shorter lvs.

squamata. Flaky F. Bark flaky: lvs. to 1 in. long, obtuse: cones oblong-ovoid, to 2½ in. long, violet. W. China.

sutchuenensis. Similar to *A. Fargesii* but differing in the shorter lvs. with yellow petioles. W. China.

taxifolia: *Pseudotsuga taxifolia.*

Veitchii. Lvs. to 1 in. long, notched at apex: cones cylindric, to 2½ in. long, bluish-purple. Japan; very hardy. Var. **nikkoensis,** cones smaller; var. **olivacea,** young cones green.

venusta. Bristlecone F. Lvs. to 2½ in. long, stiff, spiny-pointed: cones ovoid, bristly, to 4 in. long, purplish-brown. Calif.

Vilmorinii. Hybrid between *A. cephalonica* and *A. Pinsapo.*

Webbiana: *A. spectabilis.*

ABOBRA. *Cucurbitaceæ.* One extra trop. S. American tuberous-rooted diœcious vine infrequently grown under glass as an ornamental, particularly for the many showy little frs.: fls. small, greenish, solitary in the axils or the staminate racemose, fragrant. Grown mostly from seeds.

tenuifolia (*A. viridiflora*). Cranberry Gourd. St. herbaceous, to 20 ft. or more, from a carrot-like root: lvs. palmately 5-lobed and the older ones dissected: fr. cylindrical, about ⅓ in. long, scarlet.

viridiflora: *A. tenuifolia.*

ABRONIA. Sand-Verbena. *Nyctaginaceæ.* Trailing or low annuals or perennials, with fragrant red, yellow, or white verbena-like fls. borne in a peduncled showy head subtended by bracts; native in W. N. Amer., a few of minor importance for borders and flower-gardens in sunny exposures.

Abronias are treated as annuals. For early summer bloom seeds may be started indoors, but they are usually sown directly in the open ground; in mild climates seeds may be sown in the fall. Remove the husk before planting; the seeds are often slow in germinating.

arenaria: *A. latifolia.*

latifolia (*A. arenaria*). Yellow S. Per., prostrate: fls. lemon-yellow. Sea-coast Calif. to B. C.

umbellata. Pink S. The commonly cult. species: per., prostrate: fls. rose-purple. Sea-coast Calif. to B. C. Var. **grandiflora** has larger fls.

ABROPHYLLUM. *Saxifragaceæ.* One Australian shrub or small tree sometimes planted in S. Calif. **A. ornans.** Lvs. alternate, ovate-lanceolate, to 9 in. long: fls. small, yellowish or greenish, in forking clusters shorter than lvs., the sepals and petals deciduous: fr. a berry ⅓ in. across.

ABRUS. *Leguminosæ.* Slender more or less woody vines with pinnate lvs. of many small lfts., small papilionaceous fls. in axillary racemes, and short pods; native in trop. regions and sometimes grown under glass N. for ornament and the interesting seeds.

Propagated by seeds which germinate more quickly if soaked, or by cuttings of firm shoots in sand under glass.

precatorius. Rosary-Pea. Twining to 10 ft.: fls. red to purple, rarely white: pod oblong, to 1½ in. long, with shining scarlet seeds black at base, used in bead-work and for rosaries. Tropics.

pulchellus. Twining to 20 ft.; fls. pale purple: pods linear, to 2 in. long. Trop. Afr. to Malaya.

ABSINTHIUM: *Artemisia Absinthium.*

ABUMON: *Agapanthus.*

ABUTILON. Flowering Maple. *Malvaceæ.* Herbs and shrubs with alternate often lobed lvs. and bright red, yellow, white or striped mostly drooping fls.; distributed in warm climates.

Abutilons are used as house plants and for bedding out and *A. megapotamicum* makes an attractive basket-plant. They should be given the same cultivation as geraniums. Propagated by seeds and cuttings. Plants from seed sown in the open may be taken up in the fall and half of the new growth removed, for bloom in winter and spring. Some varieties are treated as annuals even if shrubby. Following are woody plants except *A. Theophrasti.*

Avicennæ: *A. Theophrasti.*

hybridum. Cultigens: lvs. slightly 3-lobed or unlobed, spotted: fls. of various colors. Most of the garden forms belong here as they cannot be referred to the pure species.

indicum. Shrubby per. to 5 ft.: lvs. entire or toothed, to 4 in. across. white-tomentose: fls. yellow, 1 in. across. Tropics.

insigne. Lvs. not lobed, wavy-toothed, to 4 in. long: fls. to 2½ in. across, white or rose with dark veins. Colombia.

megapotamicum (*A. vexillarium*). Habit drooping: lvs. not lobed, wavy-toothed, to 3 in. long, often arrow-shaped: fls. with yellow petals and red calyx, to 2 in. long, with exserted stamens, fuchsia-like. S. Amer.

mollissimum. To 10 ft.: lvs. ovate, to 6 in. or more long, pubescent: fls. yellow, about ½ in. long. S. Amer.

pictum. Lvs. 3-lobed, toothed, middle lobe broadest at base, green or variegated: fls. orange or yellow veined crimson, 1¼ in. long. S. Brazil to Argentina.—Often passes as *A. striatum.*

pleniflorum. Differs from *A. pictum* in the green lvs. and double fls. Of garden origin.

Savitzii: one of the *A. hybridum* group.

striatum. Lvs. 5–7-lobed, the middle lobe narrowed at base: fls. orange veined with dark crimson, to 1¾ in. long. Guatemala.—Not common in cult. Var. Thompsoni has lvs. variegated with yellow.

Theophrasti (*A. Avicennæ*). Ann. herb to 5 ft.: lvs. nearly entire or toothed, pubescent, to 1 ft. across: fls. yellow, to ¾ in. across. S. Asia; nat. in N. Amer.

Thompsoni: *A. striatum* var.

vexillarium: *A. megapotamicum.*

vitifolium. Lvs. 3–7-lobed, to 5 in. across, tomentose beneath: fls. light blue, to 3½ in. across. Chile.

ACACIA. *Leguminosæ.* Trees and shrubs mostly of the tropics or warm temp. regions, particularly Australia, with bipinnate lvs. or the lvs. reduced to leaf-like petioles or phyllodia and resembling a simple lf., small usually yellow fls. in stalked heads or spikes, mostly in early spring, and fr. a pod, ovate to linear, or moniliform (like a string of beads).

Acacias are grown extensively out-of-doors in warmer United States, particularly in California. They do not stand temperatures below 18–20° F. as a rule. They grow very quickly but are short-lived. In the tropics some species are grown as forage crops, for medicine, gums, soap, fibers, and other purposes. Acacias are often grown under glass for spring bloom. but are not usually well adapted to forcing as they do not thrive in temperatures above 40–50°. They need plenty of water and sunshine, and should be pruned after blooming and set out-of-doors for the summer.

Propagation is by seeds under glass or sown in the open. Germination is hastened by softening the hard seed-coats, either by placing the seed in hot ashes and leaving until cool, or by soaking in hot water which is allowed to cool for 12–48 hours. Propagated also by cuttings of half-ripened wood with a heel.

accola. Glabrous shrub to 8 ft.: phyllodia linear, 3–5 in. long, 1-nerved: fl.-heads several in racemes that are 1½–2 in. long: pods to 4 in. long and ½ in. broad, flat, with waxy lustre. Australia.

acinacea. Much branched shrub: phyllodia oblong, about ½ in. long: fl.-heads ⅛ in. or less across, usually in pairs: pods linear, curved. S. Australia.

acuminata. Tree to 40 ft.: phyllodia long-linear, to 10 in. long and ¼ in. broad, with fine parallel nerves: fls. in sessile spikes that are 1 ft. or less long: pods linear, less than ¼ in. broad, somewhat contracted between seeds. W. Australia.

adunca: *A. crassiuscula.*

alata. Shrub to 6 ft.: phyllodia decurrent along the st., forming wings to ½ in. across: fl.-heads ¼ in. across, solitary or in pairs. W. Australia. Var. platyptera (*A. platyptera*) has narrower phyllodia.

aneura. Mulga. Shrub or tree: phyllodia narrow-linear, to 3 in. long: fls. in spikes to ¾ in. long: pods to 1½ in. long. Australia, where it is used as fodder for cattle in times of drought.

arabica. Gum Arabic Tree. Tree with stipular spines: lvs. bipinnate, the lfts. to ¼ in. long: fl.-heads in pairs or clusters: pods to 6 in. long, moniliform. N. Afr., Eu.

armata (*A. paradoxa*). Kangaroo-Thorn. Shrub to 10 ft., with spines ¼ in. long: phyllodia half-ovate, to 1 in. long: fl.-heads ¼ in. across, solitary: pods to 2 in. long. Australia.

aspera. Shrub to 4 ft.: phyllodia oblong-linear, to 1½ in. long: fl.-heads solitary or in pairs: pods to 2 in. long, contracted between seeds. Victoria, New S. Wales.

Baileyana. Shrub or small tree: lvs. bipinnate, the lfts. to ¼ in. long, glaucous: fl.-heads about ⅛ in. across, in racemes to 3 in. or more long: pods to 4 in. long, glaucous. New S. Wales.

Betchei. Shrub to 12 ft.: phyllodia linear, 3 in. long: fl.-heads globular, small, in racemes 3 in. or less long: pods 4 in. long, nearly woody. New S. Wales.

binervata. Shrub or tree to 40 ft.: phyllodia falcate to lanceolate, to 4 in. long: fl.-heads in short racemes: pods to 5 in. long. New S. Wales, Queensland.

brachybotrya. Tall shrub: phyllodia obovate, to 1 in. or more long: fl.-heads in short racemes or solitary: pods linear. S. Australia.

buxifolia. Shrub, branches angled: phyllodia oblong-lanceolate and oblique, mostly 1 in. or less long, thickish, veins not prominent: fl.-heads globular, small: pods flat, ⅛ in. or less broad. New S. Wales.

calamifolia. Broom Wattle. Tall shrub: phyllodia narrow-linear, to 4 in. long: fl.-heads almost ¼ in. across, in short racemes or rarely solitary: pods to 6 in. long, constricted between seeds. S. Australia.

Catechu. Tree: lvs. bipinnate, the lfts. ¼ in. long: fls. in spikes to 5 in. long: pods to 3 in. long. E. Indies, Himalayas.—Yields black catechu.

Cavenia. Espino Cavan. Shrub to 20 ft. with stout spines, and good for hedges: lvs. bipinnate: fl.-heads clustered. Chile.

confusa. Tree to 50 ft., with terete branchlets: phyllodia narrow-lanceolate, to 5 in. or more long, rather obtuse, about 5-nerved: fl.-heads axillary and solitary: pods 3 in. or more long, somewhat inflated, more or less constricted. Philippines, Formosa.

cordata: hort. name.

cornigera. Bullhorn A. Shrub or small tree with large inflated spines resembling the horns of an ox, often twisted: lvs. bipinnate, the lfts. ¼ in. long: fls. in dense spikes to 1½ in. long: pods to 2½ in. long, beaked. Mex.

crassiuscula (*A. adunca*). Shrub, mostly with sharp-angled branches: phyllodia linear or some of them narrow-lanceolate, to 2 in. long, 1-nerved, thickish: fl.-heads small and dense, in racemes that are shorter than the phyllodia: pods linear, mostly less than ¼ in. broad, thick and coriaceous, contracted between seeds. Queensland to Tasmania.

cultriformis. Knife A. Tall shrub: phyllodia ovate, to 1 in. long, gray and glaucous: fl.-heads about ⅛ in. across, in long racemes forming a terminal panicle: pods to 3 in. long, glaucous. New S. Wales, Queensland.

cuneata. Tall shrub: phyllodia oblong, to 1 in. long: fl.-heads solitary, on stalks about as long as phyllodia: pods to 3 in. long, curved. W. Australia.

cyanophylla. Blue-leaf Wattle. Stoloniferous shrub to 18 ft.: phyllodia linear-oblong, 6–12 in. long: fl.-heads ¼ in. or more across, in short racemes: pods about 5 in. long, contracted between seeds. W. Australia.

cyclops. Shrub to 10 ft.: phyllodia narrow-oblong, to 3½ in. long: fl.-heads solitary or in short racemes, July-Dec.: pods to 2½ in. long, curved. W. Australia.

dealbata: *A. decurrens* var.

decipiens. Shrub to 12 ft.: phyllodia triangular, to ⅔ in. long: fl.-heads solitary or in pairs: pods to 2 in. long, much curved. W. Australia.

decora. Shrub, with angled branchlets: phyllodia lanceolate or linear, to 2 in. long, 1-nerved: fl.-heads globular, in racemes exceeding the phyllodia: pods flat, about ¼ in. broad, little if at all contracted between seeds. Queensland, New S. Wales.

decurrens. Green Wattle. Tree: lvs. bipinnate, the lfts. to ⅓ in. long: fl.-heads ¼ in. across, in racemes: pods to 4 in. long. Australia. Var. **dealbata** (*A. dealbata*). Silver Wattle. To 50 ft.: lvs. silvery-gray. Var. **mollis** (*A. mollissima*). Black Wattle. To 50 ft.: lvs. tomentose, yellowish when young. Var. **normalis.** Glabrous or young parts tomentose.

dentifera. Tall shrub: phyllodia narrow-linear, to 8 in. long: fl.-heads solitary or in pairs: pods to 3 in. long. W. Australia.

Dietrichiana. Phyllodia linear, to 3 in. and more long: fl.-heads about ⅛ in. across, solitary: pods 2½ in. long, contracted between seeds. Queensland.

diffusa. Shrub to 6 ft.: phyllodia linear, about ¾ in. long, stiff: fl.-heads usually in pairs: pods to 4 in. long. S. Australia, Tasmania.

discolor. Shrub or small tree: lvs. bipinnate, the lfts. ¼ in. long, pale beneath: fl.-heads in racemes: pods to 3 in. long. S. Australia, Tasmania.

dodonæifolia. Tall shrub: phyllodia lanceolate, to 4 in. long: fl.-heads solitary or in pairs: pods long and flat. S. Australia.

doratoxylon. Shrub or small tree: phyllodia to 8 in. long and ⅓ in. across: fl.-heads in dense spikes to 1 in. long: pods to 4 in. long. Australia.

Drummondii. Shrub or small tree: lvs. bipinnate, the lfts. ¼ in. long: fl.-heads in dense drooping spikes to 1½ in. long: pods to 1 in. long. W. Australia.

eburnea. Shrub with stipular spines to 2 in. long: lvs. bipinnate, the lfts. to ⅛ in. long: fl.-heads ½ in. or less across, solitary: pods to 6 in. long. Arabia to India and Ceylon.

elata. Tree to 60 ft.: lvs. bipinnate, the lfts. to 2 in. long: fl.-heads in racemes to 6 in. long, Sept.-Dec.: pods to 6 in. long. New S. Wales.

elongata. Tall shrub: phyllodia narrow-linear, to 4 in. long: fl.-heads solitary or in pairs: pods to 2½ in. long. S. Australia.

extensa. Shrub to 5 ft.: phyllodia linear, to 4 in. and more long, resembling branchlets: fl.-heads solitary or in short racemes: pods to 4 in. long, contracted between seeds. W. Australia.

falcata. Shrub or small tree: phyllodia lanceolate-falcate, to 6 in. or more long: fl.-heads in short racemes: pods to 3 in. long. Queensland, New S. Wales.

Farnesiana (*Vachellia Farnesiana*). Popinac. Opopanax. Cassie. Huisache. Sweet A. Thorny much branched shrub to 10 ft.: lvs. bipinnate, the lfts. to ⅙ in. long: fl.-heads ¼–½ in. across, very fragrant, in small clusters: pods to 3 in. long. Tex., Mex., Asia, Afr., Australia; original nativity uncertain.

filicina: *A. filicioides.*

filicioides (*A. filicina*). Shrub: lvs. bipinnate, the lfts. to ⅕ in. long: fl.-heads white, in racemes: pods 2 in. long. Tex., Mex.

fimbriata: a form of *A. linifolia* var. *prominens.*

floribunda: *A. longifolia* var.

Giraffæ. Camel-Thorn. Tree to 40 ft., with long stout spines: lvs. bipinnate: fl.-heads in clusters: pods oval, indehiscent. S. Afr.

glaucescens. Tree to 60 ft.: phyllodia lanceolate or falcate, to 6 in. long, gray-pubescent: fls. in spikes to 2 in. long: pods twisted or coiled. Queensland, New S. Wales.

grandis: *A. pulchella* var.

Greggii. Texas Mimosa. Shrub or sometimes tree to 20 ft.: lvs. bipinnate: fls. pale yellow, in spikes to 2¼ in. long, in summer: pods to 4 in. long, twisted. Tex. to Mex.

gummifera. Tree to 30 ft., with stipular spines: lvs. bipinnate: fl.-heads in spikes: pods white-tomentose, contracted between seeds. Afr.

harpophylla. Tall tree: phyllodia falcate-lanceolate, to 8 in. long, pale or glaucous: fl.-heads in clusters or short racemes: pods to 6 in. long, slightly contracted between seeds. Queensland.

hastulata. Shrub to 3 ft.: phyllodia crowded, hastate-lanceolate, to ¼ in. long, spiny-pointed: fl.-heads ⅛ in. or less across, solitary: pods to 2 in. long, curved. W. Australia.

heterophylla. Shrub to 5 ft.: phyllodia linear, often with bipinnate lvs. on adult branches: fl.-heads in racemes. Mascarene Isls.

hispidissima: *A. pulchella* var.

holosericea. Shrub or tree to 20 ft., covered with white silky pubescence: phyllodia oval-oblong, to 6 in. long: fl.-heads in spikes to 2 in. long: pods twisted. N. Australia.

homalophylla. Small tree: phyllodia lanceolate to linear, to 3 in. long: fl.-heads in pairs or clusters: pods linear, slightly curved. Australia.

implexa. Tree to 50 ft.: phyllodia lanceolate-falcate, to 6 in. or more long: fl.-heads in short racemes: pods narrow-linear, much twisted, contracted between seeds. Australia.

Jonesii. Shrub to 3 ft., very slender, branchlets hairy: lvs. bipinnate, with 5 or 6 pairs of pinnules that bear many lfts. ¼ in. or less long, nearly or quite linear: fl.-heads racemose: pods compressed and narrow, to 3 in. long. New S. Wales.

Julibrissin: *Albizzia Julibrissin.*

juncifolia. Tall shrub: phyllodia linear, to 6 in. or more long: fl.-heads solitary or in pairs: pods to 4 in. long. Australia.

juniperina. Prickly Wattle. Shrub to 12 ft.: phyllodia linear, to ½ in. long: fl.-heads solitary: pods to 2 in. long, contracted between seeds. Australia, Tasmania.

Koa. Koa. Tree to 60 ft.: phyllodia falcate, to 5 in. long: fl.-heads usually in short racemes: pods to 6 in. long and 1 in. wide. Hawaiian Isls.

latifolia. Phyllodia to 6 in. long and 2 in. across, glaucous: fl.-heads in loose spikes to 2 in. long: pods to 4 in. long. N. Australia.

Lebbek: *Albizzia Lebbek.*

leprosa. Shrub or small tree: phyllodia linear-lanceolate, to 3 in. long: fl.-heads in pairs or clusters: pod falcate. Victoria, New S. Wales.

ligulata: the plant grown under this name is probably *A. salicina.*

linearis. Shrub: phyllodia narrow-linear, to 6 in. or more long: fl.-heads in loose spikes to 2 in. long: pods to 4 in. long. Australia.

lineata. Shrub: phyllodia linear, to ¾ in. long: fl.-heads solitary: pods curved or twisted. Australia.

linifolia. Tall shrub: phyllodia linear, to 1½ in. long: fl.-heads in short racemes: pods to 4 in. long. Queensland, New S. Wales. Var. **prominens** (*A. prominens*) has broader phyllodia and pods.

longifolia. Sydney Golden Wattle. Shrub or small tree: phyllodia oblong-lanceolate, to 6 in. long: fl.-heads in loose spikes to 2¼ in. long: pods to 5 in. long. Australia. Var. **floribunda** (*A. floribunda*). Foliage at ends of branches: fls. whitish-yellow. Var. **mucronata** (*A. mucronata*). Phyllodia very narrow. Var. **Sophoræ** (*A. Sophoræ*). Phyllodia to 3 in. long and 1 in. wide, very obtuse.

lophantha: *Albizzia lophantha.*

lunata. Shrub: phyllodia oblong-falcate, to 1 in. long: fl.-heads in racemes longer than phyllodia: pods glaucous. Australia.

macracantha. Shrub or tree to 20 ft., with spines to 2 in. long: lvs. bipinnate, the lfts. ⅙ in. long: fl.-heads to ½ in. across, solitary or clustered: pods to 5 in. long. Mex., S. Amer.

macradenia. Shrub to 12 ft.: phyllodia lanceolate-falcate, to 6 in. and more long: fl.-heads in short racemes: pods to 4 in. long. Queensland.

Maideni. Shrub or tree to 50 ft.: phyllodia lanceolate-falcate, to 6 in. long: fl.-heads in spikes 1 in. long: pods much twisted. Australia.

Meissneri. Tall shrub: phyllodia obovate-oblong, to 1 in. long: fl.-heads solitary: pods long and narrow. W. Australia.

melanoxylon. BLACKWOOD A. Large tree: phyllodia oblanceolate, to 4 in. long and 1 in. wide, often with bipinnate lvs. also on young shoots: fl.-heads cream, ¼ in. across, in short racemes: pods to 5 in. long, twisted. Australia.

mollissima: *A. decurrens* var. *mollis.*

mucronata: *A. longifolia* var.

myrtifolia. Tall shrub: phyllodia obovate to linear, to 2 in. and more long: fl.-heads in short racemes: pods to 3 in. long, curved. Australia.

Nemu: *Albizzia Julibrissin.*

neriifolia. BALD A. Shrub or small tree: phyllodia linear-lanceolate, to 5 in. long: fl.-heads to ¼ in. across, in short racemes: pods to 6 in long. Australia.

nigricans. Shrub to 6 ft.: lvs. bipinnate, the lfts. to ⅕ in. long: fl.-heads solitary: pods to 1½ in. long. W. Australia.

obliqua. Drooping much branched shrub: phyllodia obovate or orbicular, to ½ in. long: fl.-heads solitary or in pairs: pods to 2 in. long, twisted. S. Australia.

obtusata. Tall shrub: phyllodia oblong-linear, to 3 in. long, stiff: fl.-heads in short racemes. New S. Wales.

Oswaldi. Shrub to 10 ft.: phyllodia falcate-lanceolate to linear, to 2 in. long, stiff: fl.-heads solitary or in clusters: pods curved or twisted. Australia.

ovata: hort. name.

oxycedrus. Stiff shrub: phyllodia linear-lanceolate, to 1 in. long: fl.-heads in dense spikes 1 in. long: pods to 3 in. long. Australia.

paradoxa: *A. armata.*

pendula. WEEPING MYALL. Small tree with drooping branchlets: phyllodia linear-lanceolate, to 3 in. long, stiff, gray: fl.-heads in pairs or clusters: pods to 3 in. long, the sutures narrowly winged. Queensland, New S. Wales.

penninervis. Tree to 40 ft. or more: phyllodia lanceolate-falcate, to 4 in. long or more: fl.-heads in short loose racemes: pods to 5 in. long. Australia. Var. **falciformis.** Shrub with longer and more falcate phyllodia.

pentadenia. Tall shrub, with usually 4-angled branchlets: lvs. bipinnate, the 2–5 pairs of pinnules bearing many lfts. ¼ in. or less long: fl.-heads globular, clustered: pods flat, 1½ in. or less long, the valves elastic. W. Australia.

pinifolia: a synonym of *A. juncifolia.*

platyphylla of lists is probably *A. alata.*

platyptera: *A. alata* var.

podalyriæfolia. PEARL A. Tall glaucous pubescent shrub: phyllodia ovate or oblong, to 1½ in. long: fl.-heads in long racemes: pods to 3 in. long. Queensland.

pravissima. SCREWPOD A. Tree to 20 ft., with drooping branchlets: phyllodia ovate, to 1 in. long: fl.-heads less than ⅛ in. across, in racemes longer than phyllodia: pods to 3 in. long, much twisted. Victoria.

prominens: *A. linifolia* var.

pruinosa. Small tree: lvs. bipinnate, the lfts. to ¾ in. long: fl.-heads in racemes: pods to 3 in. long. New S. Wales.

pubescens. HAIRY WATTLE. Shrub with drooping branchlets: lvs. bipinnate, the lfts. to ⅙ in. long: fl.-heads in racemes longer than lvs.: pods flat. New S. Wales.

pulchella. Spiny shrub: lvs. bipinnate, the lfts. to ¼ in. long: fl.-heads solitary: pods to 2 in. long. W. Australia. Var. **grandis** (*A. grandis*) is glabrous with larger lfts. Var. **hispidissima** (*A. hispidissima*) is hairy with narrow lfts.

pycnantha. GOLDEN or BROAD-LEAVED WATTLE. Small tree: phyllodia to 6 in. long and 1½ in. wide or sometimes 4 in. wide on seedlings: fl.-heads ¼ in. or more across, fragrant, in many-fld. racemes: pods to 5 in. long. S. Australia.

retinodes. Shrub or small tree: phyllodia linear-lanceolate, to 5 in. long: fl.-heads in short branched racemes: pods to 8 in. long. S. Australia. Vars. **floribunda** and **gracillima** are listed.

Riceana. Shrub or small tree: phyllodia linear, to 1½ in. long, scattered: fl.-heads in loose spikes to 2 in. long: pods to 3 in. long, curved, contracted between seeds. Tasmania.

salicina. Shrub or small tree with drooping branches: phyllodia oblong-linear, to 5 in. long: fl.-heads in short racemes or solitary: pods to 3 in. long. Australia. Var. **Wayæ.** Shrub to 8 ft.

saligna. Shrub or small tree: phyllodia lanceolate, to 8 in. and more long: fl.-heads ½ in. across, in racemes: fr. to 5 in. long, contracted between seeds. W. Australia.

Senegal. Tree to 30 ft.: lvs. bipinnate: fls. white, in axillary spikes. Trop. Afr.

Sentis. Tree to 40 ft.: lvs. lanceolate-oblong to linear, to 2 in. long: fl.-heads solitary or in pairs: pods to 3 in. long. Australia.

siculiformis. Tall shrub: phyllodia linear or linear-lanceolate, to 1½ in. long, stiff: fl.-heads solitary: pods to 1 in. long. S. Australia, Tasmania.

Sophoræ: *A. longifolia* var.

stenophylla. Tree: phyllodia linear, to 1 ft. long: fl.-heads mostly in short racemes: pods to 8 in. long, moniliform. Australia.

stenoptera. Stiff low shrub or bush: phyllodia running into long opposite wings, the upper or free part lanceolate or narrower: fl.-heads on very short peduncles: pods falcate, acuminate. W. Australia.

suaveolens. Shrub to 6 ft.: phyllodia linear, to 6 in. long: fl.-heads in racemes: pods to 1½ in. long, glaucous. Australia, Tasmania.

subulata. Shrub to 10 ft.: phyllodia narrow-linear, to 6 in. long: fl.-heads in racemes. New S. Wales.

Suma. Small tree: lvs. bipinnate, the lfts. to ¼ in. long: fl.-heads nearly white, in spikes to 4 in. long: pods to 4 in. long. India, Ceylon.

tenuifolia. Shrub with drooping branchlets: phyllodia linear-subulate, to 1 in. long: fl.-heads solitary: pods to 3 in. long. Victoria.

undulifolia. Shrub or low bush, sometimes becoming large: phyllodia ovate to nearly orbicular, to 1 in. or less long, 1-nerved, undulate: fl.-heads globular, on slender peduncles: pods flat, to ¾ in. broad. Queensland, New S. Wales.

verticillata. STAR or WHORL-LEAVED A. Shrub or small tree: phyllodia linear-subulate, to ¾ in. long, in whorls: fl.-heads in spikes 1 in. long: pods to 3 in. long. Victoria, Tasmania.

viscidula. Shrub to 15 ft.: phyllodia narrow-linear, to 3 in. long: fl.-heads mostly in pairs: pods to 2 in. long. New S. Wales.

ACACIA, BLACK: *Robinia PseudoAcacia.* **False**: *Robinia PseudoAcacia.* **Rose**: *Robinia hispida.*

ACÆNA. *Rosaceæ.* More or less evergreen trailing perennials used in mild countries as ground-cover, and sometimes N. with protection, with pinnate lvs., inconspicuous fls. in terminal heads or spikes, and fr. a bristly achene; native in the southern hemisphere, also Calif. Propagated by seeds, division and cuttings. Useful in rock-gardens.

argentea. St. creeping: lvs. silvery, of 3–4 lfts.: fls. in globose spikes. Chile.

Buchanani. Sts. prostrate and rooting: lvs. to ¾ in. long, of 11–13 lfts., whitish-green: fls. in small sessile heads, with yellowish spines. New Zeal.

cylindrostachya. Sts. prostrate: lvs. of 10–11 lfts. silky beneath: fls. in cylindrical spikes. Peru.

glauca: listed name.

inermis: *A. microphylla* var.

microphylla. New Zealand Bur. Sts. prostrate: lvs. to 2 in. long, with 7–13 lfts.: fls. in globose stalked heads to ¾ in. across, with purplish-red spines. New Zeal. Var. **inermis** has longer lvs. and spineless frs.

myriophylla. Sts. ascending: lvs. with 7–9 deeply cut lfts. silky beneath: fls. in interrupted spikes. Chile.

novæ-zelandiæ. Sts. creeping and rooting: lvs. to 3 in. long, with 11–13 lfts.: fls. in globose stalked heads to 1¼ in. across, with purplish-red spines. New Zeal.

ovalifolia. Similar to *A. microphylla* but with larger lvs. Chile.

ovina. Sts. ascending to 2 ft.: lfts. to ¾ in. long, crenate or pinnately cut: fls. purple, in long interrupted spikes. Australia.

Sanguisorbæ. Sts. creeping and rooting: lvs. to 3 in. long, of 7–11 lfts., pale beneath: fls. in globose stalked heads to ¾ in. across. Australia, New Zeal.

ACALYPHA. *Euphorbiaceæ.* Herbs, or the cult. species monœcious or diœcious shrubs with attractive foliage and small inconspicuous fls. often assembled in bracted, showy, axillary or terminal spikes or racemes. The species are many, in temp. and trop. regions of both hemispheres, some of them weedy annuals. Ours are conservatory ornamentals, employed also for bedding out far S. and for hedges and lawn specimens. The cult. is simple.

Propagated by cuttings taken from outdoor bedded plants in the fall; from plants lifted in the fall and cut back; and in summer from stock kept from the previous season; the last is the best method as cuttings with a heel may be obtained which give excellent plants for use in the conservatory in fall and winter.

Godseffiana. Profuse shrub, bushy and dense: lvs. mostly green with cream-colored margin, variable in form, lance-ovate to variously shredded: fl.-clusters shorter than lvs., greenish-yellow. New Guinea, but probably a state of *A. Wilkesiana*. The ***heterophylla*** form with ragged lvs. sometimes reduced to shreds may occur on the same plant with other lvs.

Hamiltoniana: probably a form of *A. Godseffiana* is meant.

heterophylla: *A. Godseffiana* var.

hispida (*A. Sanderi*). Chenille Plant. Redhot Cat-tail. Diœcious shrub to 15 ft.: lvs. green, broad-ovate, to 8 in. long: pistillate spikes drooping, dense, to 1½ ft. long and 1 in. wide, red or purple. E. Indies. Var. **alba** has creamy-white fls. and **ramosa** has compound spikes.

illustris: *A. Wilkesiana.*

Macafeana: *A. Wilkesiana* var.

macrophylla: *A. Wilkesiana* var.

marginata: *A. Wilkesiana* var.

Miltoniana. Described as differing from *A. Godseffiana* in larger size and more finely cut lvs.

musaica: *A. Wilkesiana* var.

obovata: *A. Wilkesiana* var.

ramosa: *A. hispida* var.

Sanderi: *A. hispida.*

tricolor: *A. Wilkesiana.*

triumphans: *A. Wilkesiana* var.

Wilkesiana (*A. illustris. A. tricolor*). Copper-leaf. Monœcious shrub to 15 ft.: lvs. profuse, elliptic or ovate, 5–8 in. long, serrate, bronzy-green mottled with copper, red or purplish: spikes slender, 8 in. long and ¼ in. wide, reddish. S. Sea Isls. There are many vars. in the trade: **Macafeana**, lvs. red marked crimson and bronze; **macrophylla**, lvs. russet-brown; **marginata**, lvs. with crimson or other margins; **musaica** (*mosaica*), lvs. green with orange and red markings; **obovata**, lvs. becoming bronzy-green with rosy-pink margins; **triumphans**, lvs. spotted crimson, green and brown. In its many color strains this plant is much planted in S. Fla. and the American tropics, less in S. Calif.

ACAMPE. *Orchidaceæ.* Strong epiphytes with thick two-ranked lvs. and small fls. mostly in short racemes, the lip with a short spur; require trop. conditions. For cult. see *Orchids.*

multiflora. To 16 in.: lvs. to 1 ft. long and 2 in. wide: fls. yellow spotted with brown, the lip white lined with dark red, in racemes to 6 in. long, July-Oct. China.

papillosa. To 10 in.: lvs. to 5 in. long and ¾ in. wide: fls. dark yellow spotted with brown, the lip white with rose wrinkles, in 16–12-fld. racemes to 1 in. long, Aug.-Sept. India.

ACANTHACEÆ. Acanthus Family. About 180 genera, mostly herbs widely distributed, largely in trop. countries, sometimes spine-bearing: lvs. opposite, simple: fls. bisexual, irregular; calyx 4–5-parted; corolla gamopetalous, 5-lobed or 2-lipped; stamens 2 or 4; ovary 2-celled with slender style: fr. a dry caps. Plants in many genera are grown for ornament in greenhouses and the open, both for showy fls. and for colored striking foliage, as Acanthus, Adhatoda, Anisacanthus, Aphelandra, Asystasia, Barleria, Beloperone, Crossandra, Dyschoriste, Eranthemum, Fittonia, Graptophyllum, Hemigraphis, Jacobinia, Justicia, Mackaya, Odontonema, Pachystachys, Peristrophe, Pseuderanthemum, Ruellia, Sanchezia, Schaueria, Stenandrium, Strobilanthes, Thunbergia.

ACANTHOCEREUS. *Cactaceæ.* Slender jointed mostly strongly 3-angled clambering or trailing cacti, usually several ft. long, the areoles with soft wool and several stiff spines: fls. white or greenish, funnelform, solitary, nocturnal; coasts of Fla. and Tex. to S. Amer. See *Cacti.*

pentagonus (*Cereus pentagonus. C. baxaniensis*). To 20 ft., sometimes rooting at tips: spines several, to 2 in. long: fls. 6–8 in. long. Fla. and Tex., south.—Sometimes employed as a greenhouse plant and in the open in its native regions.

ACANTHOLIMON. Prickly-Thrift. *Plumbaginaceæ.* Dwarf tufted hardy perennials with evergreen sharp-pointed linear rigid lvs. and fls. rose or white in tight heads, spikes or racemes; native S. E. Eu. to Asia.

The prickly-thrifts are slow-growing plants for rock-gardens and sandy places, needing sun and warmth. Propagated by cuttings in late summer and wintered under protection in a coldframe; also by layering.

glumaceum. To 6 in.: fls. small, rose, in dense one-sided racemes, July-Sept. Armenia.

lepturoides. To 3 in.: lvs. glaucous: fls. whitish, in loose racemes. Caucasus.

venustum. To 8 in.: lvs. glaucous: fls. rose or purple, in loose racemes, July-Sept. Asia Minor.

ACANTHOPANAX. *Araliaceæ.* E. Asian shrubs and trees, usually prickly, with alternate palmately lobed or compound lvs., small greenish fls. in umbels, and little blackish berries; grown for ornament and the following mostly hardy N.

Propagated by seeds sown at once or stratified, by root-cuttings over heat, or softwood cuttings from forced plants.

lasiogyne. To 20 ft.: lfts. 3, glabrous, obovate to oblong, to 2 in. or more, acute, sometimes serrate above middle: fls. in umbels. China.

pentaphyllum: *A. Sieboldianum.*

ricinifolium (*Kalopanax ricinifolium*). To 80 ft.: lvs. palmately 5–7-lobed, toothed, to 1 ft. across: fls. whitish. Japan. Var. **Maximowiczii** (*Aralia Maximowiczii*) has more deeply lobed lvs.

sessiliflorum. To 12 ft.: lvs. of mostly 3 toothed lfts. to 7 in. long: fls. dull purplish, in globular heads. Manchuria, N. China.

Sieboldianum (*A. pentaphyllum. Aralia pentaphylla*). To 10 ft., with arching branches: lvs. of 5–7 toothed lfts. to 2½ in. long: fls. greenish-white. Japan. —A good hardy shrub. Var. **variegatum** has lvs. edged with white.

spinosum. Differs from *A. Sieboldianum* in the thinner lvs. and 2 nearly distinct styles rather than 5 styles united almost to top. Japan.—Hort. material is usually *A. Sieboldianum.*

ACANTHOPHŒNIX. Spine-Areca. *Palmaceæ.* A very few monœcious feather-lvd. moderate-sized or tall trees of the Mascarene Isls., in the Indian Ocean, with spines on the long lf.-sheaths, petioles and rachis and sometimes on midribs as also on spathes: trunk swollen at base: infl. below the crown, branched and more or less drooping, the spathe-lvs. 2; fls. in 3's, the middle one pistillate; stamens 6 or more, exserted, pistillode present: fr. an oblong or globose body ¾ in. or less long; albumen not ruminate. Confusion has arisen in respect to this genus. It is one of the segregates from the old genus Areca, but two plants have been known as *Areca rubra;* one of them has come into Acanthophœnix and the other is a Dictyosperma; probably the plants cult. as Acanthophœnix are Dictyospermas, which are unarmed palms. It is doubtful whether the true Acanthophœnices are now planted in this country. See *Palm.*

crinita (*Areca crinita*). To 50 or 60 ft.: lvs. in young plant yellowish-green; petiole densely brown-tomentose, sheaths bristly and spiny; pinnæ silvery-white beneath: spathes tomentose; spadix spiny at base and on peduncle: fr. ovoid-oblong, about ½ in. or less long.

nobilis: *Deckenia nobilis.*

rubra (*Areca rubra* of botanists). To 60 ft.: lvs. of young plants with red veins; lf.-sheath with long dark spines, the pinnæ slightly glaucous beneath: spathes spiny near base; spadix armed near base and on peduncle: fr. globose, about ⅜ in. diam., prominently ridged.

ACANTHOPHYLLUM. *Caryophyllaceæ.* Several species of little stiff much branched per. often grayish plants of S. W. and Cent. Asia, one of which, **A. pungens** (*A. spinosum*) is listed among rock-garden and wall plants as *Dianthus spinosus.* Densely branched and shrubby, about 6 in. high, puberulent: lvs. subulate, spreading, about 1 in. long: fls. rose, small, in short-peduncled heads. Caucasus to Siberia.

ACANTHORHIZA. Rootspine Palm. *Palmaceæ.* Two fan-lvd. trees with bisexual fls. from Mex., Cent. Amer. and Panama, and 2 others of doubtful botanical standing from S. Amer.: trunk above carrying more or less remains of lf.-sheaths, toward base becoming clothed with hardened spiny aerial roots: lvs. orbicular in outline, cut nearly or quite to the base: fls. on short branchlets in a small spadix or cluster among the lower lvs.; stamens 6, filaments united in tube and thereby differing from Trithrinax and Thrinax: fr. globose or nearly so, with a fibrous somewhat succulent or dry outer covering; seed large, with homogeneous albumen. See *Palm.*

aculeata: *A. Mocinni.*

Mocinni (*A. aculeata. A.* and *Chamærops stauracantha*). Medium height, to 30 or 40 ft.: lvs. glaucous underneath, the petiole 3–4 ft. long on mature lvs., concave and sharp-edged: fls. white or pinkish, on short lateral spikes in the recurved infl.: fr. ⅝ in. or more diam., whitish, exocarp spongy or somewhat succulent. Mex., Guatemala; to be looked for as planted specimens in S. Fla.

stauracantha: *A. Mocinni.*

ACANTHOSABAL CÆSPITOSA: *Acœlorraphe Wrightii.*

ACANTHUS. Bears-Breech. *Acanthaceæ.* Per. herbs or small shrubs with mostly basal broad toothed or pinnatifid lvs., showy fls. dull white to rose or purple in long erect spikes; native in the Medit. region, Asia and Afr., only a few employed as ornamentals.

Heavy winter protection is needed in the North. They do best in rich well-drained soil. Propagated by seeds or by division in early autumn or spring. The bold leaves of acanthus have suggested important decorative features in art.

latifolius: *A. mollis* var.

lusitanicus: *A. mollis* var. *latifolius.*

mollis. To 2 ft.: lvs. not spiny, to 2 ft. long and half as broad, cordate at base, sinuately-lobed: fls. rose, lilac or whitish, in spikes 1½ ft. long. S. Eu. Var. **latifolius** (*A. latifolius, A. lusitanicus*) is larger-lvd., more hardy, 3 ft. tall.

montanus. To 3 ft.: lvs. 1 ft. long, pinnatifid, spiny: fls. rose-tinted, in a terminal spike to 10 in. long. W. Afr.

spinosus. To 3 ft.: lvs. pinnatifid, the lobes toothed or cut, spiny: fls. purplish, in dense spikes. S. Eu., Asia Minor.

ACAULESCENT: stemless, or apparently stemless; sometimes the stem is subterranean or protrudes only slightly and is not noticeable; a descriptive term.

ACER. Maple. *Aceraceæ.* Mostly deciduous trees with opposite usually palmately lobed or sometimes compound lvs., commonly unisexual fls., and fr. of 2 samaras long-winged on one side; native in north temp. zone.

Maples are used extensively for lawn, park and street planting; many are valuable timber trees. Most of the species are hardy in the northern states. They are strong and free-growing subjects. Ordinary soil is satisfactory for the maples. Propagated by seed sown soon after maturity or stratified and sown in spring; rare species and varieties may be budded in summer on species of the same group. Some shrubby species are propagated by layers or half-ripened greenwood cuttings, or by cuttings in early spring from plants forced in greenhouses. Fancy maples may be winter-grafted by the veneer method on seedlings of the same or related species.

argutum. To 25 ft.: lvs. 5–7-lobed, to 3 in. across, pale beneath: fls. in racemes to 2 in. long. Japan.

Buergerianum (*A. trifidum*). Trident M. Small tree: lvs. 3-lobed, to 3 in. across, pale beneath: fls. in panicles. China, Japan.

Campbellii. To 50 ft.: lvs. 5–7-lobed, to 5 in. across: fls. in cymes to 6 in. long. Himalayas.

campestre. To 50 ft. or more, the branches slightly corky: lvs. 3–5-lobed, to 4 in. across: fls. in erect corymbs. Eu., W. Asia. Some hort. vars. are: **albo-variegatum,** lvs. with large white blotches; **austriacum,** lvs. 5-lobed; **hebecarpum,** fr. pubescent; **pulverulentum,** lvs. speckled with white; **tauricum,** lvs. 5-lobed, pubescent beneath.

capillipes. To 30 ft.: lvs. 3-lobed, to 5 in. long: fls. in drooping racemes to 4 in. long. Japan.

cappadocicum (*A. lætum*). Coliseum M. To 50 ft.: lvs. 5–7-lobed, to 5½ in. across: fls. in corymbs. W. Asia. Var. **aureum,** lvs. red and golden-yellow. Var;

rubrum (*A. colchicum* var. *rubrum*, *A. lætum* var. *horticola*), lvs. when young blood-red. Var. **sinicum**, smaller, lvs. 5-lobed. China. Var. **tricaudatum**, lvs. 3-lobed. Var. **tricolor**, lvs. when young blood-red sprinkled with rosy-pink.

carpinifolium. HORNBEAM M. To 30 ft.: lvs. ovate-oblong, to 5 in. long, pinnately veined, toothed: fls. in short racemes. Japan.

catalpifolium. To 60 ft.: lvs. ovate, to 8 in. long, undivided or 3-lobed: fls. in loose corymbs. China; not hardy N.

caudatum. Large tree: lvs. 7-lobed, to 5½ in. across: fls. in erect spikes 6 in. long. Himalayas. Var. **multiserratum.** To 30 ft.: lvs. glabrous beneath. China. Var. **ukurunduense.** Small tree: lvs. pubescent beneath. Japan, Manchuria.

circinatum. VINE M. Small round-headed tree to 40 ft.: lvs. 7–9-lobed, to 5 in. across: fls. in drooping corymbs, the sepals purple: fr. red. B. C. to Calif.

cissifolium (*Negundo cissifolium*). To 30 ft.: lvs. of 3 lfts. to 3 in. long, toothed: fls. in racemes to 4 in. long. Japan.

cratægifolium. HAWTHORN M. To 30 ft.: lvs. oblong-ovate, to 3 in. long, often with 2 or 4 lobes near the base, pinnate-veined, bluish-green: fls. in erect racemes 2 in. long. Japan.

creticum: *A. orientale.*

dasycarpum: *A. saccharinum.*

Davidii. To 50 ft., with shining striped branchlets: lvs. ovate, to 6 in. long, pinnate-veined, in young plants lvs. often lobed at base: fls. in drooping racemes to 3½ in. long. China.

diabolicum. To 30 ft.: lvs. 5-lobed, to 6 in. across: fls. yellow, staminate in clusters, pistillate in racemes. Japan. Var. **purpurascens.** Fls. purple: lvs. red when young: fr. purplish.

Dieckii (*A. platanoides* var. *integrilobum*). Hybrid between *A. platanoides* and *A. Lobelii*, with lobes of lvs. entire.

Drummondii: *A. rubrum* var.

floridanum. To 50 ft., the bark white: lvs. 3–5-lobed, 2½ in. across, glaucous beneath: fls. in corymbs. Va. to Fla. and Tex.

Ginnala (*A. tataricum* var. *aidzuense*). AMUR M. Graceful shrub or tree to 20 ft.: lvs. 3-lobed, to 3 in. long, terminal lobe long, shining above, pale beneath: fls. fragrant, in panicles. Manchuria, China, Japan. Var. **Semenowii.** Shrub: lvs. deeply 3- or 5-lobed. Turkestan.

glabrum. ROCKY MT. M. Shrub or tree to 25 ft.: lvs. 3–5-lobed or 3-parted, to 5 in. across, shining above, pale beneath: fls. in corymbs: fr. often rose-colored. Mont. to Calif. Var. **rhodocarpum** has bright red frs. Var. **trisectum** (var. *tripartitum*) has lvs. usually 3-parted.

grandidentatum. To 40 ft., with dark brown scaly bark: lvs. 3–5-lobed, to 3 in. across, pubescent beneath: fls. in corymbs: fr. often rose-colored. Wyo. to N. Mex.

griseum. PAPERBARK M. To 25 ft., with cinnamon-brown flaky bark: lvs. of 3 coarsely toothed lfts. to 2½ in. long, pubescent beneath: fls. in cymes. China.

Heldreichii. BALKAN M. Medium-sized tree: lvs. 5-lobed, to 5 in. across, middle lobe divided nearly to base, shining above, glaucous beneath: fls. in erect panicles. S. E. Eu. Var. **purpuratum**, under surface of lvs. red.

Henryi. To 30 ft.: lvs. of 3 elliptic remotely toothed lfts. to 4 in. long: fls. in drooping racemes. China.

Hookeri. To 50 ft.: lvs. oblong-ovate, to 5½ in. long, toothed, caudate-acuminate: fls. in racemes to 4½ in. long. Himalayas; not hardy N.

hyrcanum (*A. Opalus* var. *hyrcanum*. *A. tauricum*). To 30 ft.: lvs. deeply 5-lobed, to 4 in. across, petioles red: fls. in drooping corymbs. S. E. Eu.

insigne. PERSIAN M. Large tree: lvs. 5-lobed, to 7 in. across, glaucous beneath: fls. in erect panicles 4 in. across. Caucasus, N. Persia. Var. **velutinum**, lvs. pubescent beneath. Var. **Van Volxemii**, lvs. to 1 ft. across. Var. **Wolfii**, lvs. red beneath.

italum: *A. Opalus.*

japonicum. FULLMOON M. Small tree or shrub: lvs. 7–11-lobed, to 5½ in. across: fls. purple, in nodding corymbs. Japan. Var. **aureum**, lvs. yellow. Var. **macrophyllum**, lvs. larger. Var. **Parsonsii** (var. *filicifolium* and *laciniatum*). FERNLEAF M. Lvs. divided nearly to base into 9–11 pinnately cut segms.

lætum: *A. cappadocicum.*

laxiflorum. To 50 ft.: lvs. oblong-ovate, to 4 in. long, sharp-toothed with 2 or 4 short lobes near base: fls. in drooping racemes. China; not hardy N. Var. **longilobum**, lvs. 5-lobed.

leucoderme. CHALK M. To 25 ft., rarely 40 ft., with light gray or grayish-brown bark: lvs. 3–5-lobed, to 3 in. across, pubescent beneath: fls. in corymbs. N. C. to Ga. and La.

longipes. To 30 ft.: lvs. 3–5-lobed, to 6½ in. across, the lobes entire, sometimes lvs. undivided: fls. in corymbs 4 in. across. China.

macrophyllum. OREGON M. To 100 ft.: lvs. 3–5-lobed or divided, to 1 ft. across, shining above: fls. fragrant, in drooping or spreading racemes to 5 in. long. Alaska to Calif.

mandshuricum. Shrub or tree to 30 ft.: lvs. of 3 oblong toothed lfts. to 4 in. long, glaucous beneath, petioles slender, red: fls. in cymes. Manchuria, Korea.

Miyabei. To 40 ft., bark of branches corky: lvs. 5-lobed, to 6 in. across, pubescent beneath: fls. in corymbs. Japan.

monspessulanum. MONTPELIER M. Shrub or tree to 25 ft.: lvs. 3-lobed, to 3 in. across, shining above, nearly evergreen: fls. in drooping corymbs. S. Eu., W. Asia.—Thrives in dry situations. Var. **ibericum**, lvs. larger, inner lobes slightly 3-lobed.

Negundo (*Negundo fraxinifolium*. *N. aceroides*. *Rulac Negundo*). BOX-ELDER. To 70 ft.: lvs. of 3–5 ovate to oblong lfts. to 4 in. long, rarely 7–9: fls. before lvs. Ont. to Fla. and Tex. Var. **argenteo-variegatum**, lvs. with white margins; **auratum** (var. *californicum aureum*), lvs. yellow; **aureo-marginatum**, lvs. edged with yellow; **aureo-variegatum**, lvs. spotted with yellow; **californicum** (*Negundo californicum*), lfts. 3; **crispum**, lfts. curled; **pseudo-californicum**, vigorous form with bloomy branchlets; **violaceum**, branchlets purplish or violet, lfts. usually 5–7.

neopolitanum: *A. Opalus* var. *tomentosum.*

nigrum (*A. saccharum* var. *nigrum*). BLACK M. To 120 ft., with black deeply furrowed bark: lvs. 3-lobed, to 5½ in. across: fls. in corymbs. Que. to Ky. and Mo.

nikoense. To 40 ft., branchlets pubescent: lvs. of 3 ovate to oblong slightly toothed lfts. to 5 in. long, pubescent beneath: fls. in nodding cymes. Japan, China.

oblongum. To 50 ft., partially evergreen: lvs. oblong, to 5 in. long, entire or sometimes 3-lobed, glaucous beneath: fls. in short panicles. Himalayas, China. Var. **concolor**, lvs. green beneath.

obtusatum: *A. Opalus* var.

Oliverianum. To 30 ft.: lvs. 5-lobed, to 4 in. across, lobes long-acuminate, shining beneath: fls. in panicles. China.

Opalus (*A. italum*. *A. opulifolium*). To 30 ft.: lvs. 5-lobed, the lobes short and broad, to 4 in. across: fls. in corymbs. S. Eu. Var. **obtusatum** (*A. obtusatum*), lvs. 5 in. across, pubescent beneath. Var. **tomentosum** (*A. neopolitanum*), lvs. to 6½ in. across, tomentose beneath. Italy.

opulifolium: *A. Opalus.*

orientale (*A. creticum*). To 15 ft. or more, half-evergreen: lvs. ovate or 3-lobed, to 2 in. long, leathery: fls. in corymbs. Medit. region.

palmatum (*A. polymorphum*). JAPANESE M. Shrub or tree to 25 ft.: lvs. deeply 5–9-lobed or divided, to 4 in. across, lobes acuminate: fls. purple, in corymbs. Japan, Korea. There are many hort. vars. as follows: **atrolineare**, lvs. dark red, divided nearly to base; **atropurpureum** (var. *nigrum*), lvs. deep purple; **aureum**, lvs. yellow; **bicolor**, lvs. purple and red; **crispum**, margins of lvs. rolled in; **Frederici-Guilelmi**, lvs. finely cut, spotted with pink and white; **Hessei**, lvs. dark purple; **linearilobum**, lvs. divided nearly to base into linear lobes; **multifidum** (var. *dissectum*, var. *decompositum*, *A. polymorphum* var. *palmatifidum*), lvs. divided to base into pinnately cut lobes; **Nicholsonii**; **ornatum**, lvs. pinnately cut, deep red; **reticulatum**, lvs. greenish-yellow with dark green veins and margin; **ribesifolium**, lvs. divided to base into jagged-edged lobes; **roseo-marginatum**, lvs. deeply cut, narrowly edged with pink; **rubellum**, a form of *multifidum* with young lvs. red; **rubrum**, lvs. large, deep red when young; **sanguineum**, lvs. purplish-red; **septemlobum**, lvs. usually 7-lobed; **sessilifolium**, lvs. deeply cut, very short-stalked; **sinuatum**; **Thunbergii**, lobes coarsely toothed or cut; **tricolor**, lvs. spotted with red, pink and white; **versicolor**, lvs. with large white spots.

pennsylvanicum (*A. striatum*). Moosewood. Striped M. To 40 ft., bark greenish striped with white: lvs. 3-lobed at apex, to 7 in. long: fls. in drooping racemes to 6 in. long. Que. to Ga.

pictum. Painted M. To 60 ft.: lvs. 5–7-lobed, to 6 in. across, the triangular lobes entire: fls. in corymbs 2½ in. across. Japan. Vars. **albo-maculatum** and **marmoratum** have lvs. spotted white. Var. **parviflorum**, lvs. cordate at base. China, Korea.

platanoides. Norway M. To 100 ft.: lvs. 5-lobed, to 7 in. across, shining above: fls. in erect corymbs. Eu., W. Asia. Some of the hort. vars. are: **aureo-marginatum**, lvs. margined with yellow; **columnare**, habit columnar; **cucullatum**, lvs. with short crimped lobes; **globosum**, with dense globose head; **laciniatum**, habit columnar, lvs. with irregular claw-like lobes; **Lorbergii**, lvs. divided nearly to base, light green; **palmatifidum** (var. *dissectum*), lvs. divided nearly to base, dark green; **rubrum** (var. *Reitenbachii*), lvs. greenish-red turning to dark red; **Schwedleri**, lvs. bright red when young; **Stollii**, lvs. with 3 entire lobes, purple when unfolding; **variegatum** (var. *albo-variegatum*), lvs. spotted with white.

polymorphum: *A. palmatum.*

Pseudo-Platanus. Sycamore M. To 100 ft.: lvs. 5-lobed, to 6 in. across: fls. in drooping panicles to 5 in. long. Eu., W. Asia. Some hort. vars. are: **bicolor**, lvs. spotted yellow turning white; **erythrocarpum**, lvs. shining, fr. red; **flavo-variegatum**, lvs. variegated with yellow; **Handjeryi**, lvs. purplish beneath; **Leopoldii**, young lvs. rosy-pink variegated with yellowish-pink; **nervosum**, of pyramidal habit, lvs. yellow between veins; **purpureum** (var. *purpurascens*, var. *atropurpureum*), lvs. purple beneath; **quadricolor**, lvs. spotted white, pink when young; **tomentosum** (var. *villosum*), lvs. pubescent beneath; **tricolor**, young lvs. purplish spotted with yellow; **variegatum** (var. *albo-variegatum*), lvs. variegated with white; **Worleei**, lvs. deep yellow, petiole reddish.

rubrum. Red, Scarlet, or Swamp M. To 120 ft.: lvs. 3–5-lobed, to 4 in. long, shining above, glaucous beneath: fls. red or scarlet, before lvs. Newf. to Fla. and Tex. Valuable as a street and park tree. Var. **columnare**, of columnar habit; **Drummondii** (*A. Drummondii*), lvs. 5-lobed, pubescent beneath, Ind. to La.; **globosum**, of compact habit; **magnificum**, lvs. scarlet in fall, veined green; **tomentosum**, lvs. 5-lobed, pubescent beneath; **tridens**, lvs. 3-lobed near apex, pubescent beneath.

rufinerve. To 40 ft., young branches glaucous: lvs. 3-lobed, to 5 in. long: fls. in erect racemes. Japan. Var. **albo-limbatum**, lvs. with margin of white spots.

saccharinum (*A. dasycarpum*). Silver or White M. To 120 ft.: lvs. deeply 5-lobed, to 6 in. across, silver-white beneath. Que. to Fla. and Okla. Garden vars. are: **albo-variegatum**, lvs. spotted white or pink; **crispum**, lvs. cut and crimped; **heterophyllum**, lvs. with deep unequal lobes; **lutescens**, lvs. yellow; **pyramidale**, of pyramidal habit; **tripartitum**, lvs. divided nearly to base into 3 lobes; **Wieri**, branches drooping, lvs. deeply divided into cut lobes.

saccharum. Sugar or Rock M. To 120 ft.: lvs. 3–5-lobed, to 6 in. across, light green beneath: fls. in corymbs. Que. to Fla. and Tex. Var. **monumentale**, Sentry M., of columnar habit. Var. **Rugelii**, lvs. usually with 3 entire lobes.

Sieboldianum. Shrub or small tree: lvs. 7–9-lobed, to 3 in. across, lobes acuminate: fls. in nodding corymbs. Japan. Var. **microphyllum** has lvs. about 2 in. across.

spicatum. Mountain M. Shrub or tree rarely 30 ft.: lvs. 3- or slightly 5-lobed, to 5 in. long, pubescent beneath: fls. in erect spikes to 5 in. long: fr. bright red in summer. E. N. Amer. Var. **laciniatum**, lvs. deeply lobed and cut.

striatum: *A. pennsylvanicum.*

tataricum. Shrub or tree to 20 ft.: lvs. ovate, to 4 in. long, pinnate-veined, toothed: fls. in erect panicles: fr. bright red in summer. S. E. Eu., W. Asia.

tauricum: *A. hyrcanum.*

tetramerum. To 30 ft.: lvs. ovate, to 3 in. long, usually 3-nerved at base, toothed, sometimes slightly lobed: fls. in racemes. China. Var. **lobulatum**, lvs. slightly lobed. Var. **tiliifolium**, lvs. cordate, pubescent beneath.

Trautvetteri. To 50 ft.: lvs. deeply 5-lobed, to 6 in. across, shining above, glaucous beneath: fls. in erect panicles. Caucasus.

trifidum: *A. Buergerianum.*

truncatum. To 25 ft.: lvs. deeply 5-lobed, 4 in. across, lobes entire or middle one sometimes 3-lobed, acuminate: fls. in erect corymbs to 3 in. across. China.

Tschonoskii. To 20 ft.: lvs. 5–7-lobed, to 4 in. across: fls. in racemes. Japan.

velutinum: *A. insigne* var.; the *A. velutinum* of botanists probably not in usual cult.

ACERACEÆ. Maple Family. Two genera, Acer and Dipteronia, of trees and shrubs. The plants bear opposite prevailingly simple lvs., polygamous or diœcious fls. having 4–5 sepals and petals, rarely apetalous, 4–10 stamens, superior 2-celled ovary, and fr. of 2 samaras.

ACERANTHUS. *Berberidaceæ.* Hardy herbaceous perennials from Asia, with fls. in loose racemes; useful in the rock-garden or other semi-shady positions. Cult. as for *Epimedium.*

diphyllus (*Epimedium diphyllum*). Maplewort. To 5 in.: lvs. in 2's, obliquely cordate-ovate: fls. white, small, May–June. Japan. Var. **roseus** has pink fls.

ACHANIA: *Malvaviscus.*

ACHENE (akene): a dry indehiscent one-seeded pericarp or fruit, as the "seeds" on the surface of the strawberry.

ACHILLEA. Yarrow. *Compositæ.* Hardy herbaceous perennials bearing clustered small white, yellow or pink heads and often finely cut foliage: heads rayed; pappus none. Native in north temp. zone.

Yarrows are grown in borders and the smaller species in rock-gardens, and bloom in spring and summer, often lasting until autumn. They are of easy culture. Propagated by division and rarely by cuttings. Seeds should give blooming plants the second year.

ageratifolia. To 8 in., tufted, silvery-pubescent: lvs. pinnatifid: fls. white. Greece. Var. **Aizoon** (*Anthemis Aizoon*) has lvs. entire or merely toothed.

Ageratum. Sweet Y. To 1½ ft.: lvs. oblong, toothed: fls. yellow. Eu.

argentea. Silvery Y. Less than 1 ft. high: lvs. 3-parted or pinnatifid, silvery-silky-pubescent: fls. white. Dalmatia.

cartilaginea. To 2 ft.: lvs. oblong-lanceolate, toothed: fls. white. Eu.

Clavennæ. To 1 ft., tufted, silvery-pubescent: lvs. pinnatifid: fls. white. Eu.

clypeolata. White-tomentose: lvs. linear-lanceolate, pinnatisect: fls. yellow, in dense clusters. Greece.

Eupatorium: *A. filipendulina.*

filipendulina (*A. Eupatorium*). Fernleaf Y. To 5 ft., stout: lvs. 1–2-pinnately parted: fls. yellow, in large clusters. Orient.

holosericea. To 1½ ft., silky-pubescent: lvs. pinnatifid: fls. yellow. Greece.

impatiens. To 3 ft., glabrous: lvs. pinnatifid: fls. white. Siberia, E. Eu.

ligustica. Hairy and glandular: lvs. pinnatifid: fls. white. Eu., W. Asia.

magna. To 3 ft.: lvs. 1–3-pinnately parted: fls. usually pink, the involucral lvs. edged dark brown. Eu.

Millefolium. Common Y. Milfoil. To 3 ft.: lvs. 1–2-pinnately parted: fls. white, but with pink in var. **roseum**. Eurasia, N. Amer.

mongolica: *A. sibirica.*

moschata. To 6 in., tufted: sts. simple and erect: lvs. glabrous, pinnately parted, the segms. obtuse and nearly or quite entire: fls. white. Eu.

nana. To 6 in., woolly: lvs. pinnatifid: fls. white. S. Eu.

Neilreichii: *A. nobilis.*

nobilis (*A. Neilreichii*). To 1½ ft., white-hairy or nearly glabrous: lvs. 2-pinnate: fls. dirty white. Eu.

odorata. To 1 ft., woolly: lvs. 2-pinnate: fls. white. S. Eu.

Ptarmica (*A. salicifolia*). SNEEZEWORT. To 2 ft.: lvs. lanceolate, toothed: fls. white. Eurasia, N. Amer. The var. Pearl, double, is common. Boule de Neige, Perry White and Globe are planted.

rupestris. To 8 in., tufted: lvs. linear-spatulate, entire: fls. white. S. Italy.

salicifolia: *A. Ptarmica.*

santolinoides. To 1 ft., woolly: lvs. pinnatisect: fls. white. Spain.

sericea: name of uncertain application in hort.

setacea. To 3 ft., pubescent: lvs. 2-pinnatifid, the lobes slightly prickly: fls. white or yellowish. Eu.

sibirica (*A. mongolica*). To 2 ft.: lvs. lanceolate, toothed: fls. white. Eu., N. Asia.

tomentosa. WOOLLY Y. To 1 ft., woolly: lvs. 1–2-pinnatifid: fls. yellow. Eu., Orient, N. Amer.

Tournefortii. To 1½ ft.: lvs. pinnatifid: fls. pale yellow. Greece.

umbellata. To 5 in., woolly: lvs. pinnatifid: fls. white. Greece.

ACHIMENES. *Gesneriaceæ.* Per. mostly branching herbs, 1–2 ft., with thickened, scaly or tuberous roots, grown under glass and sometimes planted out for the showy somewhat gloxinia-like fls. borne in the axils of the lvs., in reds, violet and white, spring and summer; native in trop. Amer. Most of the garden kinds are hybrids or variations from the original species.

After blooming the plants are dried off, the dry tubers being potted and started again in late winter or early spring. Propagated by offsets or division of the rhizomes, sometimes by cuttings.

grandiflora. Lvs. ovate, toothed, reddish beneath: fls. large, red-purple, often more than 1 in axil. Mex.

Haageana: *A. longiflora.*

longiflora (*A. Haageana*). TRUMPET A. Lvs. oval or ovate-oblong, toothed, pale beneath: fls. long-tubed, limb violet-blue, 1 in an axil. Guatemala.—There is a white var.

magnifica: hort. form with violet-blue fls.

patens. To 1½ ft.: lvs. ovate-pointed, unequal, serrate, hispid: fls. violet-blue, the tube shorter than limb. Mex.

Swainsoni: hort. form with mauve fls. spotted blue and throat white.

ACHLYS. *Berberidaceæ.* Per. herbs of 2 species in W. N. Amer. and Japan: lvs. of 3 lfts., long-stalked: fls. minute, without petals, borne in dense spikes on leafless scapes.

triphylla. DEER-FOOT. To 1 ft.: lfts. fan-shaped, to 6 in. across, wavy-toothed: spikes 1 in. long. Woods, B. C. to Calif.—Sometimes planted in rock-gardens and similar places.

ACHRAS (*Calocarpum*). *Sapotaceæ.* Evergreen trees grown in trop. Amer. for their edible fr.: lvs. simple, thick, clustered near ends of branchlets: fls. white, gamopetalous, in clusters of 6–12 in the lf.-axils.

Sapotes are grown in the tropics and will not endure frost. They thrive in clay or clay loam soils. Propagated by seeds from which the husk should be removed before planting. The seeds should be only slightly covered and transferred into pots when 6 or 8 inches high.

Sapota: *Sapota Achras.*

Zapota (*Lucuma mammosa*). SAPOTE. MARMALADE-PLUM. To 65 ft.: lvs. obovate, to 16 in. long: fls. ½ in. across: fr. to 6 in. long, russet-brown, flesh reddish, with 1 shining brown seed. Cent. Amer. but widely distributed in trop. Amer.

ACHYRANTHES: see *Alternanthera* and *Iresine.*

ACHYRODES: *Lamarckia.*

ACIDANTHERA. *Iridaceæ.* Tender summer-blooming cormous plants somewhat intermediate in appearance between Gladiolus and Ixia; species about 18, in Afr.

Propagation is commonly by means of the abundant spawn or cormels that form about the old corm. Treat as for gladiolus.

bicolor. To 18 in.: fls. long-tubed, drooping, creamy-white with very dark center, 1½–2 in. across. Trop. Afr.

ACINETA. *Orchidaceæ.* Strong epiphytes with large pseudobulbs, plaited lvs., and fls. in pendulous racemes on lateral leafless scapes, the lip 3-lobed; require hothouse temperatures. For cult. see *Orchids.*

Barkeri. Pseudobulbs to 6 in. long, bearing 2 lvs. to 20 in. long and 4 in. wide: fls. golden-yellow, the lip spotted with red, 1½ in. across, in racemes to 16 in. long, Sept.-Nov. Mex.

Humboldtii: *A. superba.*

superba (*A. Humboldtii*). Pseudobulbs to 4 in. long, bearing 3 lvs. to 15 in. long and 2 in. wide: fls. reddish-brown spotted with red, the lip yellow spotted with purple, 2½ in. across, in racemes to 1 ft. long. Venezuela, Peru.

ACKAMA. *Cunoniaceæ.* Small trees native in New Zeal., Australia and New Guinea, with opposite pinnate lvs., small unisexual fls. in compound panicles, and fr. a small leathery caps.; one species sometimes grown in S. Calif.

rosæfolia. To 40 ft.: lvs. of 3–8 pairs of oblong toothed lfts. to 3 in. long. New Zeal.

ACŒLORRAPHE. *Palmaceæ.* One gregarious handsome hermaphrodite fan-palm of everglade Fla. and W. Indies, unarmed except for the spiny slender petioles: spadix long and branched, among the lvs. and surpassing them; fls. small, solitary or in 2's or 3's; stamens 6, nearly or quite equal in length, the filaments broad at base: fr. a globular glabrous drupe about ⅜ in. thick, black. **A. Wrightii** (*Serenoa* and *A. arborescens. Paurotis androsana. Acanthosabal cæspitosa*). EVERGLADE PALM of Florida, SAW-CABBAGE P. Trunks slender, several or very many, strict, to 40 ft.: lvs. nearly or quite orbicular, 2–3 ft. and more across, divided below the middle into narrow segms., green above and silvery underneath. For cult., see *Palm.*

ACOKANTHERA (*Toxicophlœa*). *Apocynaceæ.* Shrubs or small trees, containing strong poisons, sometimes grown under glass and in the open in warm countries for the showy white or pinkish fragrant fls.; native in Afr. Propagated usually by cuttings in early spring.

spectabilis. WINTER-SWEET. Shrub 8–10 ft. or more with long narrow lvs. and clustered slender fls. nearly or about 1 in. long. S. Afr.

venenata. BUSHMANS-POISON. Lvs. broad and relatively short: fls. smaller. S. Afr.

ACONITE: *Aconitum.* Winter: *Eranthis.*

ACONITUM. Aconite. Monkshood. *Ranunculaceæ.* Herbaceous perennials, usually branched, sometimes semi-climbing, with tuberous or thickened roots, delphinium-like foliage, showy hooded fls. in blue, white and sometimes yellow in late summer and autumn; they contain violent poisons; native in north temp. zone.

Aconitums require a rich soil; partial shade is better than full sun as the flowers last longer. They should not be moved until absolutely necessary. They are useful in rear borders and as specimen clumps. Propagated by seed or division of the roots, seeds giving flowers second and third years. The tall slender kinds of the Fischeri group may need staking. The cultivated monkshoods are not clearly differentiated. The hood or helmet is formed of one of the sepals, in which the two upper petals are contained; the other three petals are minute or may be absent.

acutum: a synonym of *A. Napellus.*

Anthora (*A. pyrenaicum*). Pyrenees M. To 2 ft.: segms. of lvs. linear: fls. pale yellow, the rounded helmet produced into short beak. S. Eu. Var. **aureum** is deeper yellow.

aureum: *A. Anthora* var.

autumnale. To 5 ft.: lvs. pedately 5-lobed: fls. blue, lilac or whitish, the helmet closed. N. China.—It is not certain whether the plants cult. under this name really belong here.

barbatum: a synonym of *A. lycoctonum.*

bicolor: probably a form of *A. Fischeri.*

californicum: *A. columbianum.*

Cammarum (*A. exaltatum*). To 4 ft.: lvs. with bluntish lobes: fls. purple, in loose few-fld. panicles, the hood closed. Hungary.

carneum: listed name.

chinense. To 6 ft.: lvs. cut into 3 toothed or divided lobes: fls. bright blue, the helmet semi-circular. China.

columbianum (*A. californicum*). To 3 ft.: lvs. cut into 5 toothed or divided lobes: fls. blue or rarely white, the helmet strongly beaked and higher than broad. B. C. to Calif. and New Mex.—Very close to *A. Fischeri* and by some authorities not kept distinct.

exaltatum: *A. Cammarum.*

Fischeri. To 6 ft.: lvs. cut into 3 lobed or notched divisions: fls. blue or white, the helmet about as broad as long and produced into spur-like visor. Asia.—Many garden names are associated with this group which seems to be highly variable.

flavescens: hort. name.

japonicum. To 4 ft.: lvs. 2–3-divided, shining dark green: fls. deep blue or violet tinged red, the conical helmet with abruptly pointed beak. Japan.

Lamartini: listed name.

longiligulatum: listed name.

lycoctonum (*A. vulparia*). Wolfsbane. To 6 ft.: lvs. cut into 3–9 broad toothed or lobed divisions: fls. yellow or cream, the conical helmet constricted below the summit. Eu., Siberia.

moldavicum: a synonym or form of *A. lycoctonum.*

Napellus (*A. pyramidale*). To 4 ft.: lvs. 2–3-divided into linear segms: fls. blue, the helmet much broader than high and with beak-like visor. Eu. Very poisonous. Var. **album** has white fls. and var. **bicolor** blue and white. Var. **præcox** is advertised, also Sparksii or Sparks var.

orientale. To 4–5 ft., with broad panicle: lvs. palmatifid, the lobes acute: fls. cream-color, helmet long and narrowly cylindrical. Caucasus.

paniculatum. To 3 ft.: lvs. cut into 3–7 toothed or divided lobes: fls. blue, the helmet swollen on one side and beaked. Eu.

præcox: listed name.

pyramidale: *A. Napellus.*

pyrenaicum: *A. Anthora.*

Stoerkianum. The plant in the trade under this name is probably a form of *A. Fischeri.*

strictum: a synonym of *A. Napellus.*

uncinatum. To 5 ft., partially climbing: lvs. cut into 3–5 toothed or divided lobes: fls. blue, the helmet about as broad as long and decurved beak. Pa. to Ga. and Wis.

variegatum. To 6 ft.: lvs. cut into 3 lobed segms.: fls. blue to white, the helmet higher than broad and without prominent beak. Eu.

volubile. The plant in cult. under this name is probably *A. uncinatum.*

vulparia: *A. lycoctonum.*

Wilsonii. A form or variety of *A. Fischeri* with violet fls.

ACORUS. *Araceæ.* Herbs inhabiting marshy places, having long slender parallel-veined grass-like lvs., and fls. on a greenish spadix which appears to be borne laterally on the scape due to the leaf-like spathe; sometimes planted in bog-gardens; hardy. Propagated by division.

Calamus. Sweet Flag. To 6 ft.: lvs. to ¾ in. wide: spadix to 4 in. long. Northern hemisphere. Var. variegatus has lvs. striped yellow.

gramineus. To 1 ft.: lvs. grass-like: spadix to 2 in. long. Asia. Var. variegatus has lvs. striped white.

japonicus variegatus: *A. Calamus* var. *variegatus.*

ACRISTA MONTICOLA: *Euterpe globosa.*

ACROCLINIUM: *Helipterum roseum.*

ACROCOMIA. *Palmaceæ.* Armed monœcious feather-palms, some 15 kinds in trop. Amer., a few of which are planted in S. Calif. and S. Fla.: trunk mostly tall, cylindric or swollen, often prickly: lvs. pinnate, with narrow mostly drooping or curving pinnæ: spadices among the lvs., branched and drooping, with 2 stiff-hairy or prickly spathes; staminate fls. on upper part of branches; stamens 6: fr. rather large, usually 1 in. or more diam., the endocarp or inner shell with 3 pores near middle. Suitable for S. Fla. and *A. mexicana* reported hardy in S. Calif. See *Palm.*

aculeata (*A. media*). Grugru. To 40 ft. or more, cylindric or somewhat thickened upward, armed with rings of black prickles, bearing a handsome crown of arching and drooping foliage: lvs. 10 ft. and more long, with numerous linear pinnæ, shining above, rachis prickly: fr. globose, somewhat flattened at ends, about 1¾ in. diam., smooth and yellowish, in a large hanging truss. W. Indies.

media: *A. aculeata.*

mexicana. Trunk thick, 10–15 ft. high, with long prickles, more or less ringed below: lvs. 8–10 ft. long, arching, the short petiole and the rachis prickly and sheaths strongly black-spiny; segms. thin and narrow: fls. yellow, fragrant: fr. globose, 1 in. diam., edible. Mex., Guatemala.

sclerocarpa. Trunk 15–30 ft., thickened at base or near middle, with sharp spines: lvs. 10–15 ft. long, the outer ones arching; segms. narrow-linear and acuminate, puberulent and glaucescent underneath, 2½ ft. long, ⅓ in. broad, prickles on rachis 1½–2 in. long: fr. globose, 1½ in. diam. Jamaica to Brazil.

Totai. Trunk columnar, 30–40 ft., more or less swollen near middle, bearing a dense head of arching and drooping lvs., ringed and with many spines: lvs. medium size, glabrous and green both sides; segms. linear and acute, thickish; petiole tomentose and sparsely spiny: fr. globose, ½ in. diam. Paraguay, Argentina, Bolivia.

ACRONYCHIA. *Rutaceæ.* Trees or shrubs with mostly simple lvs. (of 1 lft.) and white or yellowish polygamous fls. in panicles or cymes; native from trop. Asia to Pacific Isls., one planted in S. Calif.

Baueri. Tree: lvs. opposite, ovate or obovate, to 4 in. long: fls. very small, pubescent outside: fr. ½ in. diam. Australia.

ACROPERA LODDIGESII: *Gongora galeata.*

ACROSTICHUM: *Elaphoglossum crinitum.*

ACTÆA. Actea. Baneberry. Cohosh. *Ranunculaceæ.* Herbaceous perennials with compound lvs., small white fls. in showy terminal clusters in spring, and attractive shiny berries in summer and autumn.

They are useful in the rockery, the wild-garden or the border. They also do well in woods or in other shady places. Propagated by seed sown in late fall or in spring; root-division in spring is the best method.

alba. White B. To 1½ ft.: berries white, on stout pedicels. N. S. to Ga. and Mo.

japonica: *Cimicifuga japonica.*

rubra. Red B. To 2 ft.: berries red, on slender pedicels. N. S. to Pa. and Neb.

spicata. Herb-Christopher. Black B. To 2 ft.: fls. white or bluish: berries purplish-black. Eu., Japan.

ACTINIDIA. *Dilleniaceæ.* Shrubby twining vines grown for their attractive foliage and *A. chinensis* also for the edible berries: lvs. alternate, long-stalked: fls. in axillary clusters or sometimes solitary, cup-shaped, usually white: native in Asia. The species here listed are hardy N. with the exception of *A. chinensis* and perhaps *A. coriacea.*

Actinidias grow equally well in sunny and half-shady locations. Propagated by seeds, sown in spring; also by cuttings of half-ripened wood in summer or of hard wood under glass; or even by layers. They are good vines for trellises and arbors.

arguta (*A. volubilis*). Bower A. Tara-Vine. Lvs. to 6 in. long: fls. white, brownish at base, ¾ in. across, anthers dark purple: fr. greenish-yellow, sweet. Japan, Korea, Manchuria.

chinensis. Yangtao. Lvs. to 5 in. long, white-tomentose beneath: fls. white turning yellow, to 2 in. across: fr. with gooseberry-like flavor. China.

coriacea. Lvs. oblong, to 4 in. long, glabrous: fls. reddish, small: fr. spotted. China.

Kolomikta. Lvs. often variegated with white or pink, to 5 in. long: fls. white, ¾ in. across, solitary: fr. yellow or greenish. Japan, Manchuria, China.

polygama. Silver-Vine. Lvs. to 6 in. long, usually variegated with white or yellowish: fls. white, ¾ in. across, solitary fr. yellow, bitter. Japan, Korea, Manchuria, China.

purpurea. Lvs. oblong or elliptic, to 4 in. or more long, dentate, glabrous underneath unless on midrib: fls. about ½ in. across: fr. purple, to 1 in. long, sweet. China.

volubilis: *A. arguta.*

ACTINOLEPIS CORONARIA: *Baeria aristata.*

ACTINOPHLŒUS. *Palmaceæ.* A very few unarmed monœcious small feather-palms, sometimes cespitose, of New Guinea and Australia and neighboring islands, distinguished from Ptychosperma by the homogeneous rather than ruminate albumen in the seed which is also very deeply sulcate, lvs. often irregularly pinnate and the segms. or pinnæ long or elongate. See *Palm.*

Macarthuri (*Ptychosperma* and *Kentia Macarthuri*). Cluster Palm. Handsome palm with few or several slender ringed green trunks to 10 ft. and more high and graceful spreading and curved bright green rather soft foliage: lvs. 2–3 ft. long, lighter colored underneath; pinnæ to 40 or more, 6–12 in. long, with prominent secondary ribs, truncate and erose or jagged and fingered at apex, upper ones opposite: infl. below the lvs., short but branched: fr. ½–¾ in. long, cartridge-shaped, wrinkled and furrowed in drying. Australia.—Does well in S. Fla. in partial shade; a good palm as a tub specimen under glass.

Sanderiana (*Kentia Sanderiana*). Attractive plant with many strongly ringed sts., to 10 ft. or so: lvs. 2–3 ft., gracefully spreading or arching on the mature plant; pinnæ more slender and narrow than in *A Macarthuri,* the lower ones very narrow and long-acuminate, others oblique and erose or the narrow terminal ones truncate or barely so: fr. much as in the above.—An attractive delicate pot-plant.

ACTINOSTROBUS. *Pinaceæ.* One species allied to Callitris but differing in having numerous scale-like bracts at base of cone. **A. pyramidalis** (*Callitris Actinostrobus*). Shrub, densely branched: lvs. scale-like or sometimes needle-like: cones of 6 scales, $^3/_5$ in. across. W. Australia.

ACUAN: *Desmanthus.*

ACUTE: sharp; ending in a point.

ADA. *Orchidaceæ.* Two epiphytic orchids of which one is sometimes grown in a cool greenhouse. **A. aurantiaca.** Pseudobulbs to 6 in. long, bearing 2–3 lvs. to 9 in. long and ½ in. wide: fls. orange- or cinnabar-red, 1½ in. long, with narrow sepals and petals and much shorter 2-keeled lip, in arching 8–13-fld. racemes about as long as lvs., Jan.-Mar. Colombia.

ADAM-AND-EVE: *Aplectrum.*

ADAMS-NEEDLE: *Yucca filamentosa.*

ADANSONIA. *Bombacaceæ.* Big trees of Afr. and Australia with digitately compound lvs., large solitary pendulous fls. and woody frs.; planted as a shade tree in the tropics. The bark yields fiber and the fr. is said to be edible, known as "monkeys-bread."

digitata. Baobab. Monkey-Bread Tree. To 60 ft., developing a relatively short soft trunk to 30 ft. in diam. and a spread of branches of 30 ft.: lfts. to 5 in. long: fls. white, 6 in. across, often in advance of lvs., on long stalks, the petals soon rolling back exposing the purplish stamens: fr. to 1 ft. long, densely tomentose. Trop. Afr., where it has many uses.

ADDERS-TONGUE: *Erythronium.*

ADELIA: *Forestiera.*

ADELOCARYUM. *Boraginaceæ.* Per. or bien. herbs with alternate simple lvs. and bell-shaped fls. in terminal cymes; rarely grown in the flower-garden in warm countries.

cœlestinum (*Cynoglossum* and *Paracaryum cœlestinum*). To 5 ft., somewhat hairy: lvs. broadly ovate, to 1 ft. long, upper ones becoming smaller: fls. blue, ⅓ in. diam., in branched racemes or cymes, nearly sessile. India.—The plant cult. under this name is likely to be *Cynoglossum Wallichii.*

ADENANTHERA. Bead-Tree. *Leguminosæ.* Trees, allied to Mimosa, with compound lvs., long slender racemes of small yellow or white fls., and fr. a narrow pod with bright colored seeds; native in Old World tropics. One species grown for the ornamental seeds, under glass or in the open far S. Propagated by seeds which have been soaked in hot water.

pavonina. Red Sandalwood Tree. Peacock Flower-Fence. Lfts. about 13, oblong or ovate, to 1½ in. long: fls. white and yellow, in racemes to 6 in. or more long: pods to 9 in. long, after dehiscing much coiled; seeds red, lens-shaped, "Circassian seeds," sometimes used as beads. Trop. Asia and Afr.

ADENOCALYMNA. *Bignoniaceæ.* S. American climbing shrubs with 2 lfts. and a terminal tendril or 3 lfts., showy funnelform fls. in racemes or panicles, and long woody frs.; grown under glass or in the open only in warm regions. Propagated by cuttings.

alliaceum (*Bignonia alliacea*). Lvs. of 2 oblong lfts. to 6 in. long: fls. whitish, 2 in. long, onion-scented, in 5–8-fld. racemes. Guiana.

ADENOCARPUS. *Leguminosæ.* Low shrubs with small alternate lvs. of 3 lfts., yellow papilionaceous fls. in terminal racemes, and fr. a flat pod; native in S. Eu., Afr. and Asia Minor. Grown under glass or in the open in the S. Propagated by seeds, by cuttings of green wood, and by layers.

viscosus. Evergreen: lfts. linear-oblong. Teneriffe.—Cult. in S. Calif.

ADENOPHORA. LADYBELL. *Campanulaceæ.* Per. herbs native in Eu. and Asia, like Campanula but differing chiefly in a cup-like or cushion-like disk surrounding the base of style. Cult. as for *Campanula.* Propagated by seeds or cuttings in spring. The roots should be disturbed as little as possible.

Bulleyana. To 4 ft.: lvs. oblong-ovate or lanceolate, toothed: fls. pale blue, to ½ in. long, funnelform, in panicles; calyx-lobes narrow-lanceolate, toothed. China.

communis: *A. lilifolia.*

denticulata. To 2 ft.: lvs. ovate-lanceolate, coarsely toothed: fls. blue, small, bell-shaped, in terminal racemes; calyx-lobes triangular, toothed and spreading. Dahuria.

lilifolia (*A. communis*). To 3 ft.: lvs. ovate-lanceolate, toothed, the radical lvs. round-ovate: fls. pale blue, 1¼ in. long, bell-shaped, fragrant, in pyramidal panicles; calyx-lobes narrow, finely toothed. Eu., Asia.

nikoensis. To 1 ft.: lvs. lanceolate, toothed: fls. blue, ¾ in. long, broad-bell-shaped, in few-fld. spikes; calyx-lobes linear, toothed. Japan.

ornata. To 4 ft.: lvs. obovate, toothed: fls. bright blue, 1 in. long, funnelform, in panicles; calyx-lobes narrow-lanceolate. China.

polymorpha. To 3 ft.: lvs. ovate or broad-lanceolate: fls. blue to purple, 1 in. across, in simple or branched spikes; calyx-lobes lanceolate, entire or toothed. Russia.

Potanini. To 3 ft.: lvs. ovate-lanceolate or lanceolate, coarsely toothed or nearly entire: fls. blue, ¾ in. long, broad-bell-shaped, in racemes; calyx-lobes pinnately cut. China.

remotiflora. To 1½ ft.: lvs. ovate, coarsely toothed: fls. blue, to 1 in. long, narrow-bell-shaped, few. Japan.

verticillata. To 3 ft.: lvs. whorled, ovate-lanceolate, toothed, the radical lvs. orbicular: fls. pale blue, ⅓ in. long, tubular-bell-shaped, in whorls; calyx-lobes linear, entire, erect. Dahuria.

ADENOROPIUM: *Jatropha multifida.*

ADENOSTOMA. CHAMISO. *Rosaceæ.* Evergreen shrubs with small needle-shaped and heath-like lvs., white fls. in terminal panicles, and fr. an achene.

Planted somewhat in their native or similar regions. They need a sunny position and well-drained soil. Propagated by greenwood cuttings or by seed in the spring.

fasciculatum. To 10 ft.: lvs. about ¼ in. long: panicles to 4 in. long, May–June. S. Calif., Lower Calif.

ADHATODA. *Acanthaceæ.* Trop. shrubs with opposite entire lvs., tubular 2-lipped fls. in terminal spikes, and capsular frs.; cult. as for Jacobinia, in mild climates.

Vasica. To 8 ft. or more: lvs. oval, to 8 in. long, pubescent: fls. white striped with red, to ½ in. across, in spikes to 3 in. long. India to Ceylon.

ADIANTUM. MAIDENHAIR-FERN. *Polypodiaceæ.* Dainty shade-loving ferns with shiny black or purplish sts. and thin delicate fronds or lf.-blades either simple or divided into fan-shaped segms.; sori borne at edges of fronds; mostly of trop. Amer., in many species, a few in temp. N. Amer. and 1 native as far north as Que. and Alaska.

The greenhouse species require a temperature of 60–65°, a fairly moist atmosphere, and should be protected from full exposure to sun; soil of good loam and leaf-mold. The native species may be grown in the open in places like their native habitat, protected from wind and sun.

acutum: a form or derivative of *A. tenerum.*

æmulum: *A. cuneatum.*

affine (*A. Cunninghamii*). Lvs. to 15 in. long and 9 in. wide, 2-pinnate, segms. to 1 in. long, the stalks black and shining. New Zeal.

Bardii: a form of *A. cuneatum* with fronds to 2 ft. long.

Bausei: hort. form of *A. tenerum.*

bellum. BERMUDA M. Lvs. tufted, bipinnate, to 1½ ft. long, the segms. to ¾ in. long. Bermuda.

Capillus-Veneris (*A. Fergusonii*). SOUTHERN M. VENUS-HAIR. Slender, erect, spreading, to 1½ ft. high: lvs. 2–3-pinnate, segms. to 1 in. across, very variable. Temp. and trop. Amer., warmer parts of Old World. Var. **daphnites** has simpler fronds.

cardiochlænum: *A. polyphyllum.*

caudatum. TRAILING M. Lvs. to 1 ft. long, 1-pinnate, segms. to ¾ in. long, stalks short, brownish, hairy, rooting at apex. Old World tropics.

concinnum. Lvs. 2–3-pinnate, to 1½ ft. long and 9 in. broad, on stout black stalks. Mex. to Brazil. Var. **latum** is stiff and upright with much larger lvs.

Croweanum: *A. cuneatum* var.

cuneatum (*A. æmulum*). DELTA M. Lvs. 3–4-pinnate, to 15 in. long and 9 in. wide, segms. to ½ in. across. Brazil. There are many forms as var. **Charlottæ**; var. **Croweanum** (*A. Croweanum*), large, vigorous, hardy; var. **gracillimum** (*A. gracillimum*), fronds finely divided; var. **grandiceps**, TASSEL M., tassel-like growths at ends of fronds; var. **variegatum** has white-striped segms. Vars. **deflexum** and **dissectum** are also listed.

Cunninghamii: *A. affine.*

decorum. Rather stiff, erect, sts. stout, brown-black: lvs. 10 in. long, half or more as broad, dull green. Peru.

diaphanum. Lvs. to 6 in. long, simply pinnate or usually 2-pinnate at base, segms. to ½ in. long. Asia to New Zeal.

elegans: hort. form of *A. decorum.*

excisum. Lvs. to 1 ft. long and 4 in. wide, 2–3-pinnate, lfts. with lobed margins. Chile. Var. **multifidum** has more finely cut lvs.

farleyense: *A. tenerum* var.

Fergusonii: *A. Capillus-Veneris.*

formosum. AUSTRALIAN M. Lvs. to 2 ft. long and two-thirds as broad, usually 3-pinnate, segms. to ¾ in. long, stalks rough. Australia.

fragrantissimum: hort. form of *A. cuneatum.*

gracillimum: *A. cuneatum* var.

hispidulum. Lvs. forked at base, 2–3-pinnate, segms. to ⅔ in. long, rachis hairy and rough. Old World tropics.

Lathomi: hort. form of *A. tenerum.*

LeGrandii: a form of *A. cuneatum* var. *gracillimum.*

lunulatum. WALKING M. Lvs. 1 ft. long, rooting at apex, simply pinnate, on shiny black stalks. Tropics.

macrophyllum. Lvs. 1 ft. long, simply pinnate, segms. to 2 in. long. Trop. Amer.

magnificum: form of *A. tenerum.*

Moorei. Lvs. to 15 in. long, 2–3-pinnate, segms. to ½ in. long, deeply lobed. Peru.

mundulum: a form of *A. cuneatum.*

O'Brienii: *A. cuneatum* form.

pedatum. AMERICAN M. Hardy: lvs. forked, nearly orbicular, to 1½ ft. across, segms. oblong, stalks purplish. Woods, N. Amer.

peruvianum. Lvs. 1 ft. long, simply pinnate, segms. to 2 in. long. Peru.

polyphyllum (*A. cardiochlænum*). Lvs. 2–3-pinnate, segms. to 1 in. long, the stalks smooth and polished. S. Amer.

princeps: hort. form of *A. tenerum*.

rhodophyllum: hort. form of *A. tenerum*.

Sanctæ-Catharinæ: a form of *A. trapeziforme* with deeper lobes.

scutum: a form of *A. tenerum*.

Siebrechtii. Supposed to be a cross between *A. decorum* and *A. Williamsii*.

tenerum. BRITTLE M. FAN M. Erect, to 3 ft.: lvs. 3-pinnate, segms. ¾ in. across, deeply notched, on stout shining brown-black stalks. Trop. Amer. Var. **farleyense** (*A. farleyense*). FARLEY or BARBADOS M. Lvs. to 3 ft. long and 2 ft. wide, infertile, drooping, delicate green sometimes rose-tinted, segms. deeply cut. The race of *farleyense* known as Gloriosa produces indusia and is said to be fertile.

trapeziforme. Lvs. to 1½ ft. or more long, 2-pinnate, segms. trapezoidal, to ¾ in. across. Trop. Amer.

versaillense: hort. form of *A. cuneatum*.

Victoriæ: hort. form of *A. tenerum*.

Wagneri: hort. form of *A. decorum*.

Weigandii: a form of *A. decorum* with larger less cuneate segms.

Williamsii. Lvs. triangular, nearly 1 ft. long, segms. nearly semicircular, 3–4-lobed. Peru.

Wrighti: probably a form of *A. cuneatum*.

ADICEA: *Pilea*.

ADIPERA: *Cassia lævigata*.

ADLAY: see *Coix*.

ADLUMIA. *Fumariaceæ*. One attractive bien. vine native in E. N. Amer. and sometimes planted for ornament. It thrives in a cool damp place protected from sun and wind, as in a thicket. Propagated by seeds in spring, and often spontaneous thereafter. **A. fungosa** (*A. cirrhosa*). CLIMBING FUMITORY. MOUNTAIN FRINGE. ALLEGHENY-VINE. Lvs. 3-pinnate, fern-like, the petioles holding st. to the support: fls. white or purplish, dicentra-like, ½ in. or more long, in drooping axillary panicles: fr. an oblong caps.

ADONIDIA. *Palmaceæ*. One attractive monœcious unarmed ringed feather-palm of the Philippines where it is cult., now planted in S. Fla.: spadices borne below the lf.-sheaths, at top of trunk, short-peduncled, branched; fls. in 3's, a pistillate between 2 staminate; stamens numerous: fr. drupe-like with thin pulp, elliptic-ovoid, upwards of 1 in. long, bright red; seed 1, with ruminate albumen. **A. Merrillii** (*Normanbya Merrillii*). Rather slender single trunk, 15–20 ft.: lvs. 6 ft. or so long, strongly arching; pinnæ many and closely placed, 24–30 in. long and to 2 in. broad, bifid at apex, 1-ribbed and prominently nerved at margins.

ADONIS. PHEASANTS-EYE. *Ranunculaceæ*. Hardy herbaceous perennials and annuals with alternate finely dissected lvs. and solitary terminal red or yellow fls.; native in temp. Eu. and Asia.

A few are grown in the border and rock-garden and sometimes in the front rows of margins, the annuals in flower-gardens. Cultivation simple as any soil is satisfactory and either sunny situations or partial shade. Both the annuals and perennials may be propagated by seed sown in the spring or fall; root-division in the spring may be used for perennials.

æstivalis. SUMMER A. Ann. to 1½ ft.: fls. crimson, to 1½ in. across, June-July. Cent. Eu. Var. **citrina**, fls. citron-yellow.

aleppica. Ann. to 1 ft.: fls. red, to 2 in. across. Syria.

amurensis. Per. to 1½ ft.: fls. golden-yellow, varying to white and pink, 2 in. across, Mar. Manchuria, Japan. Sometimes double.

annua (*A. autumnalis*). AUTUMN A. FLOS A. Ann. to 2 ft.: fls. deep red with darker center, about ¾ in. across, June–Sept. Cent. Eu. to W. Asia.

autumnalis: *A. annua*.

flammea. Ann. to 1½ ft.: fls. bright scarlet, sometimes with black spot at base, to 1¼ in. across, May–July. Eu., W. Asia.

pyrenaica. Per. to 1 ft.: fls. yellow, smaller than *A. vernalis*, June–July. Pyrenees.—Differs from *A. vernalis* in the lower lvs. not being reduced to scales.

vernalis. SPRING A. Per. to 1½ ft.: fls. yellow, to 3 in. across, early spring. Eu. A white form, **alba**, and a double-fld. var. are in cult.

ADOPOGON: *Krigia*.

ADOXA. *Adoxaceæ*. One little per. herb with tuberous roots, native in N. N. Amer., N. Eu. and N. Asia and sometimes grown in the rock-garden. **A. Moschatellina.** MUSK-ROOT. To 6 in.: lvs. ternately compound into ovate 3-parted segms.: fls. green, small, in heads to ⅓ in. across, above the foliage: fr. a small green drupe.

ADOXACEÆ. MOSCHATEL FAMILY. Only one genus, Adoxa, of one species: fls. gamopetalous, with wheel-shaped 4–6-lobed corolla, 8–12 stamens, and 3–5-celled ovary.

ADVENTITIOUS: foreign; said of a plant introduced but not yet naturalized or established; applied also to buds and shoots that arise otherwise than in the normal order or place.

ÆCHMEA. *Bromeliaceæ*. Epiphytic herbs from S. Amer. with stiff lvs. in a basal rosette and yellow or red fls. borne in spikes, panicles or racemes with often colored bracts; grown for ornament in the greenhouse. For cult. see *Bromelia*.

discolor: *Æ. fulgens* var. or *Æ. miniata* var.

fasciata (*Billbergia rhodocyanea*). Lvs. to 2 ft. long, toothed, lined and marbled with white on back: fls. pink with pale red bract-lvs., in globose heads. Brazil.

fulgens. Lvs. to 16 in. long and 3 in. wide, with small teeth: fls. red tipped with blue, in panicles branched below and simple above. Brazil. Var. **discolor** has lvs. brownish- or violet-red beneath.

Mariæ-Reginæ. Lvs. to 3 ft. long and 4 in. wide, prickly-margined: fls. red tipped with violet, in dense spikes to 1 ft. or more long, the bract-lvs. brilliant crimson. Costa Rica.

miniata. Lvs. with many close-set teeth: fls. red with blue petals, in branched panicles much longer than lvs. Brazil. Var. **discolor** has lvs. purplish or brownish on back.

Ortgiesii. Lvs. to 1 ft. long and ¾ in. wide, prickly-margined: fls. red with straw-colored bracts, borne on short spikes. Brazil.

polystachya. Lvs. to 2 ft. long and 1½ in. wide, prickly-margined: fls. violet with prominent bracts, in erect panicles. Brazil.

Thibautiana: hort. name.

ÆGLE. *Rutaceæ*. Only one species, the BAEL FRUIT of India, **Æ. Marmelos.** Small tree with lvs. of 3 ovate lfts. and greenish-yellow frs. 4–6 in. across, having a very hard shell and fragrant mucilaginous edible pulp. The pulp is used in making drinks and also has medicinal value. Propagated by seeds and suited to any good soil; may be grown in the warmer citrus regions, but little planted in the U. S.

ÆGLOPSIS. *Rutaceæ.* One species, Æ. Chevalieri, in swamps near the sea in trop. W. Afr., grown experimentally in this country as a possible stock for Citrus: spiny tree or large shrub with simple persistent lvs., small fls. in clusters and bearing 10 stamens, and globose or somewhat pear-shaped usually 6-celled whitish frs. ½–¾ in. diam. with a fragrant pulp or mucilage.

ÆGOPODIUM. *Umbelliferæ.* Coarse per. herbs with creeping rootstocks, biternate lvs., yellow or white little fls. in compound umbels; 2 species in Eu. and Asia. The variegated form is commonly planted for edgings and mats in shady places. Propagated by division.

Podagraria. GOUTWEED. BISHOPS-WEED. To 14 in.: fls. white, June. Eu.; nat. in N. Amer. Var. **variegatum** has lvs. margined with white.

ÆONIUM. *Crassulaceæ.* Succulent plants of Madeira and the Canary Isls. ordinarily referred to Sempervivum (which see) but by recent writers kept distinct. The group is marked by technical characters, such as calyx with 6–12 teeth or lobes, carpels partially sunk in calyx-tube; scales various. These plants are adapted to outdoor cult. in Calif., and are interesting under glass.

arboreum. Tender, to 3 ft.: rosettes terminal, 6 in. and more across, the oblanceolate or spatulate lvs. ciliate on margins: fls. golden-yellow, about ¾ in. across, numerous in terminal thyrse. Morocco.—Cult. in S. Calif. and known sometimes as *Sedum* or *Crassula purpurascens* because of color of foliage in autumn.

cæspitosum (*Sempervivum hybridum*). Tender plant to 6 in., woody: lvs. oblong-linear, ciliate, lined with brown: fls. yellow, in a forking corymb.

canariense. Evergreen subshrub grown under glass and in the open in Calif., to 1½ ft. or more in bloom: lvs. in a large flattened or bowl-like rosette, large, obovate to spoon-shaped, with velvety appearance: fls. many in clusters, white or yellowish; petals 7–9, very narrow.

cuneatum. St. fleshy and woody, plant glabrous, to 1½ ft.: lvs. rigid, long-cuneate, light green, mucronate, short-ciliate: fls. yellow.

decorum. Much branched shrublet: lvs. thick, lanceolate, attenuate at base and sessile, acuminate-pointed, shining green and rose-tinted: fls. corymbose; petals white with rose lines.

Haworthii. St. or trunk woody and much branched at base, to 1 ft. or more, the branches short: lvs. thick, ovate-acute, glaucous and ciliate: fls. pale yellow flushed rose, 40–50 in a terminal panicle.

holochrysum. St. woody and fleshy, with spreading branches: lvs. rosulate, glabrous, broad-spatulate, narrow to base, ciliate, purplish-keeled: fls. orange, in dense thyrse.

spathulatum. Tender shrubby plant, with stout sts. 1 ft. or more high: rosettes with lvs. marked with red-brown: fls. yellow, in large many-fld. panicles.

tabulæforme. Evergreen subshrub to 1 ft. or more, grown under glass and in Calif. in the open: lvs. in flat rosettes at ends of branches, oblong-spatulate, ciliate: fls. pale yellow; petals 10–12, narrow.

undulatum (*Sempervivum Doramæ*). Robust, woody, 1½ ft.: lvs. spatulate-ovate, narrowed at base, mucronate, undulate, ciliate, sometimes reddish: fls. yellow.

AËRANGIS. *Orchidaceæ.* Very short-stemmed epiphytes with mostly white fls. in long many-fld. racemes, the lip with long slender spur. See *Orchids* for cult.

modesta (*Angræcum modestum* and *Sanderianum*). Lvs. to 6 in. long: fls. snow-white, about 1¼ in. across, the spur to 3 in. long, in pendulous racemes, Apr.–May. Madagascar.

AËRIA: *Gaussia attenuata.*

AËRIDES. *Orchidaceæ.* Epiphytes with thick two-ranked lvs. sheathing at base and fls. in lateral pendulous racemes, the 2 lateral sepals attached to base of column, the dorsal sepals and petals similar, the lip 3-lobed and produced into a hollow usually upturned spur; cult. in the hothouse. See *Orchids.*

affine: *A. multiflorum.*

crassifolium. Lvs. to 8 in. long and 2 in. wide: fls. rose-purple, 1½ in. across, the spur greenish at tip, in racemes longer than lvs., May–June. Burma.

expansum: *A. falcatom.*

falcatum (*A. Larpentæ. A. expansum*). Similar to *A. crassifolium* but with amethyst-red lip and white sepals and petals spotted with purple, May–June. Burma. Var. **Houlletianum** (*A. Houlletianum*) has whiter lip and yellowish-brown sepals and petals. Var. **Leoniæ** (*A. Leoniæ*) has larger fls. with white lip spotted and edged with dark red.

Fieldingi. Lvs. to 10 in. long and 1½ in. wide: fls. white dotted and suffused with rose, 1½ in. across, the spur white, in racemes longer than lvs., May–June. India.

Houlletianum: *A. falcatum* var.

Larpentæ: *A. falcatum.*

Lawrenciæ. Lvs. to 1 ft. long and 2 in. wide: fls. 1½ in. across, sepals and petals white tipped with amethyst-purple, the lip white with purple central lobe and green spur, in racemes as long as lvs., June–Aug. Philippine Isls. Var. **Sanderianum** has creamy-white sepals and petals tipped with magenta and yellow, magenta and creamy-white lip.

Leonæi: *A. falcatum* var.

multiflorum (*A. affine. A. roseum*). Lvs. to 9 in. long and ¾ in. wide: fls. 1 in. across, the sepals and petals white spotted and tipped with purple, the lip light purple deeper in middle, in racemes longer than lvs., July–Sept. Himalayas to Cochin-China.

odoratum. Lvs. to 8 in. long and 2 in. wide: fls. fragrant, about 1 in. long, the petals and sepals white with purple spot at tip, the lip white spotted with red and the middle lobe rose, in racemes often longer than lvs., July–Sept. India to China, Philippine Isls. Var. **majus** has larger fls.

quinquevulnerum. Differs from the above only in having the middle lobe of the lip toothed on the edges. Philippine Isls.

roseum: *A. multiflorum.*

Sanderianum: *A. Lawrenceæ* var.

vandarum. Lvs. to 8 in. long, cylindrical: fls. 2 in. long, white and somewhat transparent, in 1-3-fld. racemes shorter than the lvs., Feb.–Mar. Himalayas.

ÆRVA. *Amaranthaceæ.* Herbs or subshrubs of trop. Asia and Afr.: lvs. alternate or opposite: fls. very small, often polygamous, in spikes. One is grown as a border plant in warm regions.

sanguinea: *Æ. scandens* var.

scandens. More or less climbing subshrub but may be trimmed as a tall edging subject: lvs. ovate to lanceolate, to 4 in. long: spikes to 1 in. long, white-woolly, shining. Asia, Afr. A variety or race has dark red lvs.

ÆSCHYNANTHUS: *Trichosporum.*

ÆSCULUS. HORSE-CHESTNUT. BUCKEYE. *Hippocastanaceæ.* Large deciduous shrubs or trees cult. for their showy clusters of red, white or yellow fls. mostly in May and June, for the large digitately compound lvs., and for the large often spiny frs.

Horse-chestnuts are mostly hardy north except Californian and Himalayan species. Propagated by seed sown in the autumn or stratified, by side-grafting, by budding on common species and the shrubby kinds also by layers. *Æ. parviflora* may also be propagated by root-cuttings.

arguta. Texas B. Shrub to 7 ft.: lfts. 7–9, lanceolate or broader, to 5 in. long, bluntly serrate, becoming glabrous: fls. yellowish-green. E. Tex.

austrina: *Æ. discolor* var. *mollis.*

Briotii: *Æ. carnea* var.

Bushii. Hybrid between *Æ. discolor* and *Æ. glabra:* tree to 30 ft.: fls. pink and yellow. Ark., Miss.

californica. Tree to 40 ft.: lfts. 5–7, stalked: fls. white or pale rose, in panicles to 8 in. long. Calif.

carnea (*Æ. rubicunda*). Red H. Hybrid between *Æ. Hippocastanum* and *Æ. Pavia:* tree to 40 ft.: lfts. usually 5, nearly sessile: fls. flesh-color to scarlet, in panicles to 8 in. long. Var. **Briotii,** fls. scarlet. Var. **plantierensis,** Damask H., fls. whitish tinged pink, fading to pink. Var. **pendula,** branches drooping.

chinensis. Tree to 60 ft.: lfts. 5–7: fls. white, ½ in. or less long. China.

discolor. Woolly B. Shrub or tree to 30 ft.: lfts. 5, short-stalked, white-tomentose beneath: fls. yellow and red, in panicles to 8 in. long. Ga. to Tex. Var. **mollis** (*Æ. austrina*), fls. bright scarlet. Var. **flavescens,** fls. yellow.

flava: *Æ. octandra.*

georgiana (*Æ. neglecta* var. *georgiana*). Shrub to 6 ft.: lfts. 5, nearly sessile: fls. red and yellow, in dense panicles to 6 in. long. N. C. to Fla. and Ala.

glabra (*Æ. ohioensis*). Ohio B. Tree to 30 ft.: lfts. 5, short-stalked: fls. greenish-yellow, in panicles to 6 in. long. Pa. to Ala. and Neb. Var. **leucodermis.** Bark smooth, nearly white. Mo., Ark. Var. **Sargentii** (var. *Buckleyi*). Shrub: lfts. 6–7. Ohio to Miss.

Harbisonii. Hybrid between *Æ. discolor* var. *mollis* and *Æ. georgiana:* fls. bright red, in panicles to 8 in. long.

Hippocastanum. Common H. Tree to 100 ft.: lfts. 5–7, sessile: fls. white blotched with red and yellow, in panicles to 1 ft. long. Balkan Peninsula. Some of the vars. are: **Baumannii,** fls. white, double; **Henkelii,** lfts. cut-lobed; **incisa,** lfts. deeply toothed or lobed; **laciniata,** lfts. deeply cut; **luteo-variegata,** lvs. variegated with yellow; **Memmingeri,** lvs. marked with white; **pumila,** dwarf; **pyramidalis,** habit pyramidal; **Schirnhoferi,** fls. yellowish-red, double; **umbraculifera,** head round.

humilis: *Æ. Pavia* var.

hybrida (*Æ. Lyonii*). Hybrid between *Æ. octandra* and *Æ. Pavia:* tree: lfts. 5, short-stalked: fls. red and yellow, in panicles to 6 in. long.

indica. Tree to 60 ft.: lfts. 5–9, short-stalked: fls. white, upper petals yellow blotched, lower tinged rose, in panicles to 15 in. long. Himalayas.

lutea: *Æ. octandra.*

Lyonii: *Æ. hybrida.*

macrostachya: *Æ. parviflora.*

marylandica. Hybrid between *Æ. glabra* and *Æ. octandra.*

Michauxii: *Æ. neglecta.*

neglecta (*Æ. Michauxii*). Tree to 60 ft.: lfts. 5, nearly sessile: fls. pale yellow veined red, in panicles to 6 in. long. N. C.

octandra (*Æ. flava. Æ. lutea*). Yellow B. Sweet B. Tree to 90 ft.: lfts. 5, short-stalked: fls. yellow, in panicles to 6 in. long. Pa. to Ga. and Ill.

ohioensis: *Æ. glabra.*

parviflora (*Æ. macrostachya*). Bottlebrush B. Dwarf H. Shrub to 12 ft.: lfts. 5–7, nearly sessile: fls. white, in panicles to 1 ft. long. S. C. to Fla. and Ala.

Pavia (*Pavia Michauxii. Æ.* and *P. rubra*). Red B. Shrub or small tree to 20 ft.: lfts. 5, short-stalked: fls. dark red or purplish, in panicles to 7 in. long. Va. to Fla. and La. Vars. **atrosanguinea,** fls. dark red; **humilis** (var. *nana, Æ. humilis*), low, often prostrate; **sublaciniata,** lfts. deeply toothed.

plantierensis: *Æ. carnea* var.

rubicunda: *Æ. carnea.*

rubra: *Æ. Pavia.*

sinensis: *Æ. turbinata.*

splendens. Shrub to 12 ft.: lfts. 5, densely pubescent beneath: fls. bright red, in panicles to 8 in. long. Ala. to La.

turbinata (*Æ. sinensis*). Japanese H. Tree to 30 ft.: lfts. 5–7, sessile: fls. yellowish-white with red spot, in panicles to 10 in. long. Japan.

Wilsonii. Tree to 80 ft.: lfts. 5–7, stalked: fls. white spotted yellow, in panicles to 1 ft. long. China.

woerlitzensis. Tree: fls. red, in panicles to 5 in. long. Garden origin. Var. **Ellwangeri** (*Æ. Pavia* var. *Whitleyi*), fls. darker.

ÆTHEOPAPPUS: *Centaurea pulcherrima.*

ÆTHIONEMA. Stone-Cress. *Cruciferæ.* Dwarf herbs and subshrubs allied to Iberis, mostly with small narrow lvs. and pink, lilac, purplish or rose-colored, sometimes white, fls. in terminal racemes: pod or silicle short and broad, mostly winged. About 50 species of the Medit. region, a few of them grown in the border or rock-garden, blooming mostly in May and June. They may be used also as cut-fls.; one species sometimes cult. is an ann. flower-garden subject, with broad lvs.

If grown in a light sandy soil in dry sunny locations, they will not need replanting or renewal for many years in regions where hardy, as in southern New England or southward. The perennial types are propagated by cuttings in summer or by seeds in the spring, and by division; the annuals and biennials only by seeds.

Buxbaumii (*Æ. cappadocicum*). Short-season ann., 3–6 in., with oblong lvs. to 1 in. long and minute lilac fls., grown for its erect racemes of large thin winged overlapping pods. S. E. Eu. and S. W. Asia.

cappadocicum: *Æ. Buxbaumii.*

coridifolium. Lebanon S. Per., 4–10 in.: lvs. crowded, nearly linear, 1 in. or less long: fls. light or rosy-lilac, in short dense racemes. Chalky summits of Mt. Lebanon and Taurus.—See *Æ. pulchellum.*

diastrophis. Per. to 6 in., little branched: lvs. oblong-linear: fls. small, rosy-lilac: pod dentate. Asia Minor.

glaucum: listed name.

grandiflorum. Persian S. Per., 1½ ft., with simple branches: lvs. oblong-linear, to 1½ in. long: fls. pink or rose, ¼ in. across, in slender racemes: fr. notched at top. Persia.

iberideum. Tufted low per.: lvs. crowded and very narrow: fls. large, showy, white, in short racemes. E. Medit. region, Asia Minor.

Kotschyi: listed name for a very dwarf plant with rosy-pink fls.

persicum: listed name for a foot-high plant with deep rose fls.

pulchellum. Per. with branched sts.: lvs. linear-oblong, obtuse: fls. rosy-pink, in heads or racemes: pod dentate. Asia Minor.—Cult. plants passing as *Æ. coridifolium* may belong here.

saxatile. Per. to 1 ft., simple or branched: lvs. many, oval to lanceolate: fls. small, pink, in a close but elongating raceme: pod oblong, notched. S. Eu., Algeria.

schistosum. Per., sts. many, 2 in. or more high, erect and simple: lvs. narrow-linear, somewhat acute: fls. large, rose-color: pod orbicular or broader than long. Asia Minor.

stylosum. Per. to 1 ft. or less: lvs. large, ovate-lanceolate, ½ in. long: fls. rosy-pink, in a head. Lebanon.

superbum: listed name.

trinervium (*Iberidella trinervia*). Per., woody: lvs. oblong to nearly linear, stiff, more or less 3-nerved, the upper ones somewhat clasping: fls. large, white. Persia.

warleyense. Said to be a hybrid: compact but spreading, 3–6 in. high: fls. brilliant rose-pink or rose-carmine or one form paler: foliage steel-blue.

AGAPANTHUS (*Abumon*). *Liliaceæ*. One African herb with tuberous rootstocks, popular as a tub plant or big subject in pots, and out-of-doors in warm regions. **A. africanus** (*A. umbellatus*). African-Lily. Lily-of-the-Nile. To 3 ft.: lvs. basal, linear-lanceolate: fls. funnel-shaped, bright blue, to 2 in. long, in terminal umbels. Hort. vars. are **albidus** with white fls., **Mooreanus** with dark blue fls., and **variegatus** with striped lvs.—It does well in large tubs and will bloom for several years without rehandling if given liquid manure; will also force satisfactorily. Propagated by division of roots or rarely by seeds.

AGARITA: *Mahonia trifoliolata*.

AGASTACHE (*Lophanthus*). *Labiatæ*. Per. N. American tall herbs with 4-angled sts., toothed lvs., 2-lipped purplish, blue or yellowish fls. in terminal spikes; sometimes grown in the border or wild-garden.

cana: *Brittonastrum canum*.

nepetoides. To 5 ft.: lvs. ovate to ovate-oblong, to 6 in. long: fls. greenish-yellow, ⅓ in. long, in dense spikes to 1½ ft. long. Que. to Ga. and Ark.

AGATHÆA CŒLESTIS: *Felicia amelloides*.

AGATHIS. Dammar-Pine. *Pinaceæ*. Very tall evergreen trees with broad leathery lvs., staminate fls. cylindrical, and globose cones; native from the Philippines to Australia and New Zeal. For cult. see *Conifers*. Can be grown out-of-doors only in the warmer parts of the country, as in Fla. and Calif.

alba (*A. orientalis*). Lvs. oblong to oblong-lanceolate, to 4 in. long: staminate fls. ¾ in. long. Malaya.

australis. Kauri-Pine. Lvs. oblong, to 1½ in. long or to 4 in. on young trees, sessile: staminate fls. to 1½ in. long. New Zeal., where it makes forests of ponderous trees.

orientalis: *A. alba*.

robusta. Lvs. ovate- to oblong-lanceolate, to 3 in. long: staminate fls. 1½ in. long. Australia.

AGATHOSMA (*Hartogia*). *Rutaceæ*. S. African shrubs with small lvs., small white, red or lilac fls. mostly in terminal umbels or heads, and fr. of 2–4 carpels; grown for ornament in warm regions, sometimes in pots under glass. For cult. see *Diosma*.

Ventenatiana. To 1 ft. or more, much branched: lvs. overlapping, ovate-lanceolate, ¼ in. long: fls. lilac, purple or white, in umbels.

villosa (*Diosma purpurea*). To 1 ft.: lvs. overlapping, lanceolate, ¼ in. long: fls. light purple, in dense terminal heads.

AGATI. *Leguminosæ*. One tree native in trop. Asia but nat. in W. Indies and S. Fla. **A. grandiflora** (*Sesbania grandiflora*). To 40 ft.: lvs. pinnate, of 10–30 pairs of lfts. to 2 in. long: fls. papilionaceous, red or white, to 4 in. long: pods linear, flat, to 2 ft. long. An ornamental tree for warm regions, with striking fls. and pods.

AGAVE. *Amaryllidaceæ*. Important economic and decorative plants with usually stiff spiny and often succulent long lvs. in rosettes or basal, fls. in spikes or panicles on long upright scapes or sts. produced in some types every year and in others at long intervals, in some cases the plants even dying after blooming; native in arid and semi-arid warm regions of western hemisphere. Many species are found in collections of succulents or of economic plants, some are grown as ornamentals in warm sections; in Mex. they furnish food, drink, fiber, razor strops and soap. *A. americana* is in common cult. as a porch and tub plant, but most of the species are known in hort. only to fanciers and in large or botanical collections.

Agaves need a soil mostly of loam and sand, good drainage and firm potting. Most species can be propagated by seeds, but often the flowers must be artificially hand-pollinated in order to secure them; some kinds are propagated by the suckers around the old plants or by underground stems; others by stem buds and a few by the bulbels which are found in the flower-clusters.

albicans. St. very short: lvs. to 1 ft. long and 4 in. wide: infl. about 3 ft.; fls. reddish-green, 1½ in. long. Mex.? Var. **medio-picta** is a milk-white striped-lvd. form.

altissima: *A. americana*.

americana (*A. altissima*). Century Plant. Trunkless: lvs. to 6 ft. long and 8 in. wide, gray, smooth, in enormous rosettes: fls. yellowish-green, 3½ in. long, in a bracted scape or stalk to 40 ft. tall, produced when plant is ten years or more old; suckers are usually produced at base as the plant dies. Trop. Amer. Var. **marginata** has yellowish-white or deep yellow margins. Var. **variegata**, lvs. dark green and yellow, twisted.

angustifolia (*A. Jacquiniana. A. ixtlioides. A. vivipara. A. Wightii*). Trunk to 1½ ft.: lvs. to 2 ft. long and 3 in. wide, gray-green: infl. to 8 ft. high; fls. greenish, 2 in. long. Cent. Amer.? Var. **marginata** (*variegata*) had lvs. margined with white.

antillarum. Trunkless: lvs. about 3 ft. long and 3 in. wide, bright green: infl. 15 ft.; fls. deep orange, 2 in. long. Haiti.

applanata. Trunkless: lvs. to 4 ft. long and 4 in. wide, gray-green: infl. to 30 ft.; fls. yellow, 3 in. long. Mex.

atrovirens. Pulque A. Trunkless: lvs. to 6 ft. long and 1 ft. wide, dark green: infl. to 30 ft.; fls. greenish-yellow, 4 in. long. S. Mex.—The drink pulque is derived principally from this species.

attenuata (*A. glaucescens*). Trunk to 5 ft., sometimes prostrate: lvs. unarmed, to 2½ ft. long and 10 in. wide: infl. spike-like, to 10 ft.; fls. greenish-yellow, 2 in. long. Mex.—Occasionally bulbels are produced.

cærulescens: *A. lophantha* var.

carchariodonta. Trunkless: lvs. to 1 ft. or more long and 3½ in. wide, prickly: infl. a spike to 12 ft. high; fls. greenish or brownish. Habitat unknown.

Consideranti: *A. Victoriæ-Reginæ*.

decipiens (*A. spiralis*). Trunk to 8 ft.: lvs. to 4 ft. long and 4 in. wide, prickly: infl. a panicle, to 20 ft.; fls. greenish-yellow, 3 in. long. S. Fla.

deserti. Trunkless: lvs. in dense rosettes, 1 ft. long and 2 in. wide, gray-green, with triangular prickles: infl. a panicle, 6 ft. high; fls. yellow, 1¼ in. long. Colo. Desert, Calif.

Eichlami. Trunkless: lvs. in rosettes, the edges with brown spines. Guatemala.

elegans: *A. potatorum*.

ferox. Trunkless: lvs. to 4 ft. long and 1 ft. wide, fleshy: infl. to 30 ft.; fls. yellow, 3½ in. long. Mex.

filifera. Trunkless: lvs. in dense rosette, to 1½ in. broad and 1 or 2 ft. long, entire, spine-tipped, margins with filaments: fls. maroon-purple, 2 in. or more long including the long stamens, the scape to 15 ft. (shorter under glass). Mex.

fourcroydes (*A. Ixtli. A. longifolia I. rigida*). Henequen. Trunk to 6 ft.: lvs. to 7½ ft. long and 4 in. wide, grayish-green: infl. to 20 ft.; fls. greenish, to 3 in. across, ill-smelling. Yucatan.—Furnishes fiber.

Franceschiana. Trunk very short: lvs. to 3 ft. long and 4 in. wide, dark or blue-green: infl. to 15 ft.; fls. green, 2½ in. long, ill-smelling. Mex.?

Franzosinii. Trunkless: lvs. to 8 ft. long and 1 ft. wide, whitish-green: infl. to 40 ft.; fls. yellowish, 3½ in. long. Mex.?

Ghiesbrechtii (*A. Ghiesbreghtii*). Trunkless: lvs. to 2½ ft. long and 4 in. wide, sometimes striped: infl. to 9 ft.; fls. greenish or brownish, 2 in. long. Mex.

glaucescens: *A. attenuata*.

heteracantha. Nearly trunkless: lvs. to 2½ ft. long and 2½ in. wide, slightly striped: infl. to 15 ft. Mex.

horrida: *A. noli-tangere*.

Houlletiana or **Houllettii**: *A. sisalana*.

hystrix: *A. stricta*.

ingens. Nearly trunkless: lvs. to 6 ft. long and 14 in. wide, dark green or grayish-green: infl. to 30 ft.; fls. yellowish-green, 3½ in. long. Mex. Var. picta, lvs. yellow-margined.

Ixtli: *A. fourcroydes*.

ixtlioides: *A. angustifolia*.

Jacquiniana: *A. angustifolia*.

Kerchovei. Trunkless or short-trunked: lvs. to 1½ ft. long and 2½ in. wide, gray-green, triangular, fibrous: infl. to 18 ft.; fls. 1½ in. long. Mex.

lævis: *A. sisalana*.

latifolia: *A. potatorum*.

Lecheguilla: *A. lophantha* var. *Poselgeri*.

longifolia: *A. fourcroydes*.

lophantha. Crested A. Short-trunked: lvs. to 3 ft. long and 3 in. wide, green, glossy, striped beneath: infl. spike-like, to 15 ft.; fls. greenish-yellow, 1½ in. long. Mex. Var. cærulescens (*A. cærulescens*) is a glaucous form without stripes. Var. Poselgeri (*A. Lecheguilla*) has smaller lvs. with a pale central band, bluish-green and striped beneath.

lurida (*A. mexicana*). Trunkless or nearly so: lvs. to 3 ft. long and 6 in. wide, with small teeth, glaucous: infl. a panicle, to 20 ft.; fls. greenish, 3 in. long. Mex.

macrantha. Trunkless: lvs. long and narrow, 5½ in. wide: infl. to 5 ft.; fls. yellowish, 3 in. long. Mex.

maculosa. Trunkless or nearly so: lvs. to 1 ft. long and ¾ in. wide, gray-green, spotted with dark green: infl. 3 ft. or more; fls. greenish or whitish more or less tinged with pink, fragrant, 2 in. long. S. Tex.

marmorata (*A. Todaroi*). Trunkless: lvs. to 6 ft. long and 1 ft. wide, very rough, gray and green-banded: infl. 10 ft. high; fls. golden, 1½ in. long. Mex.

mexicana: *A. lurida*.

micracantha. Trunkless: lvs. to 1½ ft. long and 5 in. wide, bright green, paler beneath: infl. about 10 ft.; fls. brownish-green, 1½ in. long. Mex.?

miradorensis. Dwarf Century Plant. Trunkless: lvs. to 3 ft. long and 5 in. wide: infl. to 9 ft.; fls. greenish, 2 in. long, fetid. Mex.

mitis. Trunk very short: lvs. to 15 in. long and 4 in. wide, with small teeth: infl. 6 ft. high; fls. brown, 2 in. long, in racemes. Mex.

neglecta. Blue Century Plant. Trunkless: lvs. to 3 ft. long and 6 in. wide, gray: infl. to 40 ft.; fls. yellowish-green, 2 in. long, fetid. Fla.

noli-tangere (*A. horrida*). Lvs. to 1½ ft. long and 3 in. wide, the margins toothed: infl. to 8 ft.; fls. green, 1½ in. long, in spikes. Mex.

Parryi. Trunkless: lvs. to 1 ft. long and 4 in. wide, glaucous, prickly-margined: infl. to 16 ft.; fls. creamy-yellow, 2¼ in. long, in panicles. Ariz., New Mex., Mex.

parviflora. Small: lvs. 4 in. long and ¼ in. wide: infl. to 5 ft.; fls. greenish-white, ½ in. long. S. Ariz.

polyacantha. Nearly trunkless: lvs. to 3 ft. long and 6 in. wide: infl. to 15 ft.; fls. 2 in. long. Mex.

potatorum (*A. elegans. A. latifolia. A. pulchra*). Trunkless: lvs. to 1 ft. long and 4 in. wide: infl. 12 ft.; fls. yellowish-green, 2½ in. long. Mex.

pulchra: *A. potatorum*.

rigida: *A. fourcroydes*.

Salmiana. Trunkless: rosettes very large, lvs. to 7 ft. long and 1½ ft. wide, prickly-margined: infl. 30 ft.; fls. yellow, in panicles. Mex.

scabra (*A. Wislizeni*). Trunkless: lvs. to 10 in. long and 6 in. wide, gray, prickly-margined: infl. 12 ft.; fls. yellow, 2½ in. long. Mex.

schidigera. Trunkless: lvs. to 1½ ft. long and ½ in. wide, with marginal threads: infl. 10 ft.; fls. 2 in. long, in racemes. Mex.

Sebastiana. Nearly trunkless: lvs. to 1 ft. long and 4 in. wide, gray-green: infl. 6 ft.; fls. yellow, 3½ in. long. Lower Calif.

Shawii. Nearly trunkless: lvs. 1½ ft. long and 5 in. wide, prickly-margined: infl. to 10 ft. high; fls. greenish-yellow, 3½ in. long, in panicles. Calif.

sisala: *A. sisalana*.

sisalana (*A. Houlletiana* or *Houllettii. A. lævis. A. sisala*). Sisal Hemp. Trunk to 3 ft.: lvs. to 5 ft. long and 4 in. wide, green or grayish: infl. to 20 ft.; fls. greenish, 2½ in. long, ill-smelling. Habitat unknown.

spiralis: *A. decipiens*.

striata. Trunkless: lvs. 1½ ft. long and 1 in. or more wide, gray striped with dark green: infl. to 12 ft.; fls. greenish, in spikes. Mex.

stricta (*A. hystrix. Bonapartea, Littæa* and *Yucca hystrix*). Hedgehog A. Trunkless: lvs. to 14 in. long and ¼ in. wide, often pale or purplish: infl. to 12 ft.; fls. 1¼ in. long. Mex. Var. glauca has glaucous lvs.

tequilana. Tequila A. Trunkless: lvs. to 3 ft. long and 3 in. wide, gray-green: infl. 20 ft.; fls. 2½ in. long. Mex.

Todaroi: *A. marmorata*.

Victoriæ-Reginæ (*A. Consideranti*). Trunkless: lvs. to 6 in. long and 2 in. wide, dark green with gray margin: infl. 12 ft.; fls. greenish, 1¼ in. long. Mex.

virginica: *Manfreda virginica*.

vivipara: *A. angustifolia*.

Weberi. Trunkless: lvs. to 2½ ft. long and 8 in. wide, margins entire: infl. a panicle. Mex.

Weingartii. Trunkless: lvs. variable, apple-green. Guatemala.

Wightii: *A. angustifolia*.

Wislizeni: *A. scabra*.

xylonacantha. Trunkless or nearly so: lvs. to 3 ft. long and 2 in. wide, dark striped beneath, with horny prickly margins: infl. to 7 ft.; fls. 1½ in. long, in spike-like racemes. Mex.

AGDESTIS. *Phytolaccaceæ.* One woody or herbaceous vine from a very large gray tuberous root, grown out-of-doors in S. U. S. and thriving in rich soil. Propagated by offsets. **A. clematidea.** Climbing to 50 ft.: lvs. alternate, cordate-ovate, to 3 in. or more across: fls. white, star-shaped, to ½ in. across, without petals, in panicled racemes. Mex., Guatemala.

AGERATUM. *Compositæ.* Herbaceous annuals with tassel-like clustered heads, usually blue or white, and mostly opposite lvs.: florets all tubular; pappus of scales. Ageratums require the usual cult. for annuals; the dwarfer kinds are excellent for edgings.

conspicuum: *Eupatorium glechonophyllum*.

conyzoides. To 2 ft.: lvs. ovate, toothed, blunt or rounded at base: fls. blue or white, in heads to ¼ in. across, all summer; involucral bracts oblong, slightly hairy. Tropics.

Houstonianum (*A. mexicanum*). Differs from *A. conyzoides* in lvs. usually heart-shaped at base, blue fls. in larger heads, and involucral bracts linear-lanceolate and densely hairy. Mex. Var. **nanum** is dwarf.

Lasseauxii: *Eupatorium Lasseauxii*.

mexicanum: *A. Houstonianum*.

AGLAONEMA. *Araceæ.* Trop. Asian and African rhizomatous or stoloniferous herbs with oblong or oblong-lanceolate lvs. having thick midribs and sheathed petioles, and unisexual fls. borne on a spadix subtended by a spathe.

Glasshouse subjects grown for the attractive often variegated foliage; succeed in fibrous loam with rotted manure, sand and charcoal added. Propagated by division and cuttings.

commutatum. To 2 ft.: lvs. to 6 in. long and 2 in. across, deep green marked on veins with pale green. Malaya.

costatum. Sts. short, branching at base: lvs. to 8 in. long and 4 in. across, variously spotted with white. Malaya.

Curbesi: hort. name.

pictum (*A. versicolor*). Sts. to 10 ft. long: lvs. to 6 in. long and 2 in. across, clouded or spotted with white. Malaya.

Robelinii. Very robust: lvs. to 10 in. long and 5 in. wide, obscurely marked with pale green. Malaya.

siamense. Sts. to 1½ ft. long: lvs. to 10 in. long and broad, the petioles about 6 in. long. Siam.

simplex. Erect to 3 ft., rooting below: lvs. lance-oblong or somewhat broader, acuminate, to 12 in. long at maturity, green: spathe greenish or whitish inside, to 2 in. long. Borneo, Celebes.—Grown in water as "Chinese evergreen," thriving in poorly lighted places, infrequently blooming.

versicolor: *A. pictum.*

AGONIS. *Myrtaceæ.* Australian shrubs or trees with alternate simple lvs., fls. in dense sessile heads, and fr. a leathery caps.; grown for ornament in S. Calif. For cult. see *Leptospermum.*

flexuosa (*Leptospermum flexuosum*). To 40 ft.: lvs. willow-like, to 6 in. long: fls. white, the axillary heads ½ in. across; stamens usually 20. W. Australia.

linearifolia. To 12 ft. or more: lvs. linear or linear-lanceolate, to 1 in. long: fls. white, in small axillary heads; stamens 10. W. Australia.

marginata. Tall shrub: lvs. obovate-oblong, to 1 in. long: fls. white, in terminal or axillary heads; stamens 10. W. Australia.

AGRIMONIA. AGRIMONY. *Rosaceæ.* Per. erect herbs mostly of the north temp. zone, with alternate pinnate lvs., small yellow fls. in racemes, and fr. a bristly burr; sometimes grown in shady or rear places for interest but not particularly ornamental; also medicinal. There are several N. American species, but apparently not planted. Propagated by root-division in spring and by seeds.

Eupatoria. To 3 ft.: lfts. gray-hairy beneath: bristles of fr. spreading. Eu.

pilosa. To 5 ft.: lfts. with stiff hairs on veins beneath: bristles of fr. incurved. Eu.

AGRIMONY: *Agrimonia.* **Hemp**: *Eupatorium cannabinum.*

AGRITO: *Mahonia trifoliolata.*

AGROSTEMMA. CORN COCKLE. *Caryophyllaceæ.* As now defined, a genus of 2 species of ann. or bien. herbs, Eu. and Asia, one of them a showy weed and sometimes known as a cult. plant, **A. Githago** (*Lychnis Githago*). Grayish erect branching silky-hairy plant to 3 ft., with long-linear erect lvs.: fls. purplish-red and more or less spotted, 1 in. or more across, petals obcordate and exceeded by the very long leaf-like calyx-lobes (which are deciduous in fr.). Common in wheat-fields. See *Lychnis.*

AGROSTIS. BENT-GRASS. *Gramineæ.* Tufted annuals and perennials of small or medium size and many narrow lvs., the small spikelets borne in open diffuse panicles; of world-wide distribution and furnishing familiar hay, pasture, and lawn grasses as well as flower-garden subjects. The names in this genus are not well standardized. See *Grasses.*

alba: *A. palustris.*

canina. BROWN BENT. VELVET BENT. Per. to 2 ft.: lvs. to 2 in. long and 1/12 in. wide: panicles to 7 in. long, branches very slender. Newf. to Alaska, Pa. and Tenn.—Used for lawns.

capillaris (*A. vulgaris. A. tenuis*). RHODE ISLAND BENT. Similar to *A. palustris* but smaller and with shorter redder panicles. Eu.; nat. in N. Amer.—Used for pasture.

hiemalis. HAIR-GRASS. SILK-GRASS. Per. to 2 ft.: lvs. to 5 in. long and 1/12 in. wide: panicles often purplish, to 2 ft. long, branches hair-like and bearing spikelets only toward tips. N. Amer.—Ornamental.

laxiflora: *A. retrofracta.*

maritima (*A. alba* var. *maritima*). CREEPING BENT. Creeping per. to 1½ ft., sts. often decumbent and stoloniferous: lvs. to 3½ in. long and 1/12 in. wide, rough: panicles dense, to 4 in. long, branches erect. Shores Eu., E. N. Amer.—Used in lawns.

nebulosa. CLOUD-GRASS. Ann. to 1 ft.: lvs. short and very narrow: panicles to 6 in. long, with many very fine branches bearing spikelets near tips. Spain.—Ornamental.

palustris (*A. alba*). REDTOP. FIORIN. Per. to 3½ ft.: lvs. to 8 in. long and ¼ in. wide: panicles to 1 ft. long, green or reddish. Eu.; nat. in N. Amer.—Used for pastures.

pulchella: *Aspris capillaris* var.

retrofracta (*A. laxiflora*). Ann. to 2 ft.: lvs. to 8 in. long and ⅛ in. wide, rough above: panicles to 1 ft. long, branches hair-like and bearing prominently awned spikelets toward tips. New Zeal., Australia, Hawaii; intro. into U. S.—Ornamental.

tenuis: *A. capillaris.*

vulgaris: *A. capillaris.*

AICHRYSON. *Crassulaceæ.* Succulents of the Canary Isls., intermediate between Sedum and Sempervivum (see the latter), with cup-shaped calyx 5–12-lobed, scales ciliate, carpels partially immersed in calyx-tube.

dichotomum. Ann. or bien.: sts. erect and forked, hairy: lvs. obovate or spatulate: fls. yellow, in loose corymb, petals 8 or 9.

domesticum (*Sempervivum tortuosum* of DeCandolle) is an old garden hybrid: erect slightly shrubby free-flowering somewhat hairy plant: lvs. spatulate, to 1 in. long: fls. yellow.

AILANTHUS (*Pongelion*). *Simaroubaceæ.* Large deciduous trees of Asia and N. Australia, one planted widely as a street and yard tree as it is smoke-resistant and free from insects: lvs. pinnately compound, ill-scented when bruised: fls. small, green, in large terminal panicles, polygamous: fr. a samara with the seed in the middle.

The ailanthus grows on any upland soil and tends to spread as seedlings; propagated by seed sown soon after ripening and by root-cuttings.

altissima (*A. glandulosa. A. japonica*). TREE-OF-HEAVEN. To 60 ft. or more, rapid growing: lvs. of 13–25 lfts. to 5 in. long, glabrous beneath, with large gland-bearing or callous teeth at base: fr. 1½ in. long. China; nat. in E. N. Amer.—Only the fertile-fld. types should be planted as the staminate fls. exhale a sweetish or to some persons a disagreeable odor. Var. **erythrocarpa** (*A. rubra*), fr. bright red. Var. **pendulifolia**, lvs. large and drooping. Var. **sutchuenensis**, petioles purplish, frs. larger.

glandulosa: *A. altissima.*

imberbiflora. To 100 ft.: lvs. of 15–20 glabrous lfts. to 3 in. long: fr. 2 in. long. Australia.

japonica: *A. altissima.*

rubra: *A. altissima* var. *erythrocarpa.*

Vilmoriniana. To 50 ft.: lvs. of 17–35 lfts. to 6 in. long, pubescent beneath: fr. 2 in. long. China.

AIRA (*Deschampsia*). *Gramineæ.* Low or medium-sized mostly per. grasses of temp. regions, the shining, pale or purplish spikelets borne in open loose panicles; rarely grown for ornament. See *Grasses.*

cærulea: *Molinia cærulea.*

capillaris: *Aspris capillaris.*

flexuosa. To 2½ ft.: lvs. involute, 3–6 in. long: panicles to 8 in. long, open, the branches flexuous. Eu., E. N. Amer.

pulchella: *Aspris capillaris* var.

AIR-PLANT: *Bryophyllum pinnatum.*

AIZOACEÆ. Carpet-Weed Family. Widely distributed low mostly succulent herbs or subshrubs, of about 20 formerly listed genera but now of much greater number with the segregations from Mesembryanthemum, with regular bisexual fls. having many or no petals, 4–5-parted calyx, 4–5 or many stamens, superior or inferior 2- or more-celled ovary, and fr. a caps. The plant body is sometimes reduced to nearly or quite globular proportions, particularly in the dry and desert regions of S. Afr. Known to hort. in the plants of the Mesembryanthemum group grown for ornament and fancy, and in the New Zealand spinach grown as a pot-herb: Aptenia, Aridaria, Bergeranthus, Carpanthea, Carpobrotus, Conicosia, Conophytum, Cryophytum, Delosperma, Disphyma, Dorotheanthus, Drosanthemum, Erepsia, Faucaria, Fenestraria, Glottiphyllum, Hereroa, Lampranthus, Lithops, Malephora, Mesembryanthemum, Nananthus, Oscularia, Pleiospilos, Rhombophyllum, Sceletium, Semnanthe, Tetragonia, Titanopsis, Trichodiadema.

AJUGA. Bugle-Weed. *Labiatæ.* Herbaceous annuals and perennials, grown in the rock-garden and the border, with numerous blue, white or rose fls. in whorls in terminal spikes in early summer. Propagated by seeds and division; of simple cult.

alpina: *A. genevensis.*

Brockbanki: hort. name for a blue-fld. form.

genevensis (*A. alpina. A. rugosa*). To 14 in.: lvs. oblong or obovate, toothed: fls. blue. Eu., Orient.

metallica var. crispa: hort. name for a form to 5 in. high with curled metallic glossy blue fls. in a pyramidal spike.

nutans: listed name.

reptans. Carpet B. To 1 ft., st. more or less prostate: lvs. oblong or obovate, entire or wavy: fls. white or in some vars. blue or purplish. Eu. Var. atropurpurea has blue fls. and bronze lvs. Var. multicolor, foliage spotted and variegated with yellow, brown and red. Var. rubra, lvs. dark purple. Var. variegata, lvs. splashed and edged creamy-yellow.

rugosa: *A. genevensis.*

AKEBIA. *Lardizabalaceæ.* Hardy twining shrubs with half-evergreen digitately compound lvs., odd purplish unisexual fls. in axillary racemes in spring, and fr. a purple berry; 2 species from China and Japan.

Akebias are neat vines where heavy shade is not needed; they are also used in cool greenhouses for covering walls and pillars. They need sun and well-drained soil. Propagated by seeds, by hardwood and greenwood cuttings, and by root-division.

lobata: *A. trifoliata.*

quinata. Five-leaf A. Lfts. 5, entire: fls. fragrant. China, Japan, Korea.

trifoliata (*A. lobata*). Three-leaf A. Lfts. 3, coarsely toothed or entire. Japan, China. Var. australis has leathery entire lfts. China. Var. clematifolia has thin entire lfts. Japan.

AKEE: *Blighia sapida.*

ALBIZZIA. *Leguminosæ.* Small trees or shrubs with deciduous bipinnate lvs., fls. more or less plume-like or tassel-like due to exserted stamens, in heads or spikes, white, yellow, pink, blooming in summer, and pods strap-shaped and flat without partitions; native in trop. and subtrop. Asia, Afr. and Australia, and 1 in Mex. Cult. as for *Acacia. A. Julibrissin* may be grown as far north as Washington and hardy races much farther, and the others in S. Fla. and S. Calif. and southward.

Julibrissin (*Acacia Julibrissin. A.* and *Mimosa Nemu*). Silk-Tree. Tree 30–40 ft.: lfts. ¼ in. long: fls. pink, in heads crowded on the upper ends of branches: pods to 6 in. long. Persia to Japan. Var. rosea, smaller bright pink fls., hardier.

Lebbek (*Acacia Lebbek*). Lebbek-Tree. Siris-Tree. Womans-Tongue-Tree. Tree to 50 ft.: lfts. to 1½ in. long: fls. greenish-yellow, in axillary heads: pods to 1 ft. long. Trop. Asia, N. Australia; nat. in W. Indies.

lophantha (*Acacia lophantha*). Plume A. Shrub or tree to 20 ft.: lfts. ⅓ in. long: fls. yellow, in spikes 2 in. long: pods 3 in. long. Australia.

procera. Tall tree: lfts. to 1 in. long: fls. greenish-white, in heads: pods to 7 in. long. Trop. Asia, Australia.

ALCHEMILLA. Ladys-Mantle. *Rosaceæ.* Ann. or per. herbs with palmately-lobed or -divided lvs., small greenish or yellowish fls. in corymbs, and fr. an achene; native in the north temp. zone and sometimes cult. Some of the species make good mats or low clumps of attractive foliage; fls. not showy. Propagated by seeds or division.

alpina. Per. to 8 in.: lvs. divided into 5–7 oblong lfts. toothed at tip and shining silvery-hairy beneath. Mts. of Eu.

arvensis (*Aphanes arvensis*). Ann. to 6 in.: lvs. deeply 3-parted into cut segms., pubescent, about ⅓ in. long. Eu.; nat. in E. N. Amer.

chirophylla. Per. to 8 in.: lvs. divided into 5–7 oblong-obovate lfts. toothed at tip, silky-hairy on both sides. Eu.

japonica: listed name.

major. Per. to 10 in. or more, much branched: lvs. divided into 9–11 oval lfts., hairy beneath. Mts. of Eu.

micans. A form of *A. vulgaris*, very dark green turning red in autumn. Eu.

pratensis. Tall per.: lvs. orbicular, with 5–9 shallow-toothed lobes, pubescent beneath. Eu.; nat. in N. Amer.—By some considered a form of *A. vulgaris.*

pubescens. Per. to 8 in.: lvs. with 7–11 shallow coarsely toothed lobes, silky-hairy. Eu.

sylvestris. A form of *A. vulgaris*, bluish-green turning red-brown in autumn. Eu.

vulgaris. Per. to 1½ ft.: lvs. orbicular, to 6 in. across, with 7–9 shallow toothed lobes, grayish-pubescent. Eu.

ALCICORNIUM: *Platycerium.*

ALDER: *Alnus.* **Black-**: *Ilex verticillata.* **White-**: *Clethra.*

ALECTRYON. *Sapindaceæ.* Evergreen trees with alternate pinnate lvs., bisexual or unisexual fls. in many-fld. panicles, without petals, and fr. a leathery caps.; variable; one species is grown in S. Calif.

excelsum. TITOKI. To 60 ft.: lvs. of 4–6 pairs of ovate-lanceolate nearly entire lfts. to 4 in. long: panicles to 1 ft. long: caps. ½ in. long. New Zeal.

ALETRIS. STAR-GRASS. *Liliaceæ.* Per. fibrous-rooted herbs with a basal cluster of narrow or grass-like lvs. and small white or yellow fls. in erect spikes or spike-like racemes terminating a slender scape.

Star-grass does well in moist sunny positions; useful for colonizing. Propagated by seed or division.

farinosa. To 3 ft.: lvs. pale yellowish-green, to 6 in. long: fls. white. Me. to Fla. and Ark.

ALEURITES. *Euphorbiaceæ.* Trees native in the eastern tropics, with milky juice, large alternate simple often lobed lvs., monœcious fls. in terminal panicled cymes, and rather large æsculus-like frs.; grown far S. for shade and for the seeds which yield valuable oil.

Propagated by seed sown where plants are to stand or seedlings transplanted when about 1 foot high. Also propagated by hardwood cuttings. Trees begin to bear nuts in three to six years.

cordata. JAPAN WOOD-OIL-TREE. To 30 ft.: lvs. broadly ovate-cordate, 3–5-lobed or toothed: fls. ¾ in. long, ovary 3–4-celled: fr. warty. S. E. Asia.

Fordii. CHINA WOOD-OIL- or TUNG-OIL-TREE. To 25 ft.: lvs. ovate, sometimes 3-lobed, to 5 in. long: fls. reddish-white, ovary 3–5-celled: fr. 2–3 in. across, smooth. Cent. Asia.—Now planted in Fla.

moluccana. CANDLENUT. CANDLE-BERRY-TREE. VARNISH-TREE. To 60 ft.: lvs. ovate, often with 3–5 triangular lobes, to 8 in. long: fls. white, ovary 2-celled: fr. 2 in. or more across. Malaya; nat. in tropics.

ALFALFA: *Medicago.*

ALFILARIA: *Erodium cicutarium.*

ALGERITA: *Mahonia trifoliolata.*

ALISMA. WATER-PLANTAIN. *Alismaceæ.* Aquatic mostly per. herbs with erect or floating basal lvs. and fls. in panicles, having 3 white or rose-tinged petals; a widely distributed genus. Sometimes grown about ponds and in bogs for the foliage and many small white fls. Propagated by division or seeds.

Plantago-aquatica. Lvs. oblong to ovate: fls. to ½ in. across, in whorls on panicles to 3 ft. high. Northern hemisphere; in N. Amer. as far north as Mass. and Minn.

subcordatum: the common N. American plant, by some authors considered to be distinct from the Old World *A. Plantago-aquatica.*

ALISMACEÆ. WATER-PLAINTAIN FAMILY. About 13 genera in swamps and streams around the world. Herbs with basal long-stalked lvs., regular bisexual or unisexual fls. borne in whorls on racemes or panicles, having 3 sepals, 3 deciduous petals, 6 or more stamens, many 1-celled ovaries becoming achenes in fr. Alisma and Sagittaria are grown in outdoor ponds and bogs.

ALKANET: *Anchusa.*

ALKEKENGI: *Physalis Alkekengi.*

ALLAGOPTERA (*Diplothemium*). *Palmaceæ.* Cespitose stemless S. American feather-palms of about 5 species, one of which has been planted in the open in Fla.: mostly monœcious in each spadix, which arises from the base on a long peduncle; fls. densely placed on the simple short spadix, the upper ones staminate; stamens 6–20, the filaments joined at the bottom: fr. an ovoid or oblong small yellowish or reddish drupe. See *Palm.*

campestris. Pinnæ linear-lanceolate, glaucous underneath, assembled in separate or distant groups: stamens 6–9: fr. ovoid, short-apiculate, glabrous. S. Brazil, Argentina, Bolivia.

ALLAMANDA. *Apocynaceæ.* Trop. shrubs, erect or clambering climbers, grown in conservatories and in the open far S., with opposite or whorled lvs. and large funnel-shaped yellow or purplish showy fls., essential organs deep in the tube, and fr. a large prickly caps., which is not to be expected under glass.

The cultivation of allamandas is simple, but they need extra feeding during the whole growing season. The plants should be kept nearly dry after growth ceases in late autumn till February or March; they should then be cut back and started in a moist position; all repotting should be done before the new growth is 6 inches long. Propagated from old and new wood cuttings. In warm countries they thrive profusely on walls and fences.

cathartica. COMMON A. Tall climbing: lvs. usually in 4's, obovate, to 6 in. long: fls. golden-yellow, to 3 in. across. Brazil. Vars. are: grandiflora, fls. to 4½ in. across; Hendersoni (*A. Hendersoni*), lvs. leathery, fls. to 5 in. across; nobilis (*A. nobilis*), fls. to 5 in. across, with magnolia-like fragrance; Schottii (*A. Schottii*), fls. with dark striped throat; Williamsii, fls. with reddish-brown throat.

Hendersoni: *A. cathartica* var.

neriifolia. OLEANDER A. Half climbing or erect shrub to 3 ft.: lvs. in whorls of 2–5, oval or oblong, to 5 in. long: fls. golden-yellow, 1½ in. across, swollen at base. Brazil.

nobilis: *A. cathartica* var.

Schottii: *A. cathartica* var.

violacea. Slender climber: lvs. usually in 4's, oval, to 6 in. long: fls. reddish-purple, 2½ in. across. Brazil. —Thrives best if grafted on *A. cathartica* var. *Hendersoni* or *Schottii.*

Williamsii: *A. cathartica* var.

ALLEGHENY-VINE: *Adlumia fungosa.*

ALLIONIA (*Oxybaphus*). UMBRELLA-WORT. *Nyctaginaceæ.* Mostly American herbs with opposite lvs. and fls. in terminal panicles or solitary in the axils, without petals and subtended by involucres; occasionally transplanted from the wild.

nyctaginea. Per. to 3 ft.: lvs. broad-ovate to oblong, to 4 in. long: fls. red, longer than involucre, in panicles. Ill. to Colo. and Tex.

ALLIUM. *Liliaceæ.* Bulbous herbs with mostly strong odor, narrow basal and sometimes a few cauline lvs., and small white, green, yellow, pink or purple fls. borne in umbels or heads terminating slender scapes. In some species the lvs. are terete and fistular (hollow), and in others they are broad and flat. The roots are sometimes more rhizomatous than strictly bulbous.

Several species are grown for food and others for ornament, the latter mostly for colonizing or in wild-gardens and sometimes placed in the rock-garden. The flower-garden alliums, as *A. Moly* and *A. neapolitanum*, require no special treatment and flower in spring; *A. neapolitanum* is useful for cut-flowers when grown in boxes or beds under glass. Propagated by seeds sown in early spring, by offsets and bulbels in autumn or spring. Most of the species are hardy North. See *Chive, Garlic, Leek, Onion.*

acuminatum. To 1 ft.: lvs. to ⅛ in. wide: fls. rose-purple, in many-fld. umbels. B. C. to Ida. and Calif.

albopilosum. To 3 ft.: lvs. to 1¾ in. wide: fls. deep lilac, in many-fld. umbels to 7 in. across. Persia.

ammophilum. Often united with *A. angulosum* but lower, with smaller lvs. and golden-yellow fls. Eu.

angulosum. To 1½ ft.: lvs. to ¼ in. wide: fls. lilac or purple, rarely white, in many-fld. often elongated umbels. Eu.

ascalonicum. SHALLOT. To 1 ft.: lvs. awl-shaped: fls. lilac or white, in globose heads. Probably a cultigen. See *Onion.*

atropurpureum. To 2½ ft.: lvs. to 2 in. wide: fls. rose-purple, in heads to 2½ in. across. Hungary to Himalayas.

azureum: *A. cæruleum.*

baicalense: *A. montanum* var. *glaucum.*

cæruleum (*A. azureum*). To 3 ft.: lvs. 3-angled: fls. deep blue, in dense globose umbels to 2 in. across. Siberia, Turkestan.

canadense. WILD GARLIC. Slender, to 2 ft., from a small bulb: lvs. flat or nearly so: umbel often bearing only bulblets, the fls. if any long-pediceled and pinkish. N. B. to Tex., mostly in low ground.

carinatum. To 2 ft.: lvs. ⅙ in. across: fls. rose-pink, with long protruding stamens, in loose heads. Eu.

Cepa. ONION (which see). To 3 or 4 ft.: lvs. cylindrical and hollow: fls. lilac to white, in large umbels. W. Asia. Var. **solaninum** (var. *multiplicans*), POTATO and MULTIPLIER ONION, propagates by natural divisions of the bulb. Var. **viviparum** (var. *bulbelliferum*), TOP ONION, is propagated by bulbels borne in the umbels.

cernuum (*A. recurvatum*). To 2 ft.: lvs. to ⅙ in. wide: fls. rose or white, in many-fld. nodding umbels. N. Amer.

controversum: a name of uncertain application.

crispum: *A. peninsulare* var.

cyaneum. To 1 ft.: lvs. narrow-linear: fls. blue, in many-fld. nearly globose umbels. China.

fallax: *A. montanum* var. *petræum.*

fistulosum. WELSH or SPRING ONION. To 1½ ft., glaucous: lvs. cylindrical and hollow: fls. white, in dense umbels. Asia. See *Onion.*

flavum. To 1 ft.: lvs. cylindrical: fls. yellow, in drooping umbels. S. Eu.

galanthum. Glabrous, with large bulb, st. hollow and somewhat inflated, to 16 in.: lvs. few, at base, cylindrical and hollow: fls. whitish, in an umbel. Siberia.

giganteum. To 4 ft.: lvs. to 2 in. wide: fls. lilac, in dense globose umbels 4 in. across. Himalayas.

globosum. To 1 ft.: lvs. linear and thread-like: fls. rose or white striped with rose, in many-fld. globose umbels. E. Eu., Asia Minor.

Helleri: *A. Nuttallii.*

Hermettii: *A. neapolitanum.*

hyalinum. To 14 in.: lvs. to ⅕ in. wide: fls. pale pink or white, in 6–10-fld. umbels. Calif.

hymenorrhizum. To 2 ft.: lvs. to ⅓ in. wide: fls. rose, in many-fld. globose umbels. E. Eu., W. Asia.

japonicum. Glabrous, with oblong bulb and a rhizome, st. cylindrical, to 2 ft.: basal lvs. cylindrical, 2 or 3 on st. plane: fls. purple, in a globose head. Japan.

karataviense. To 8 in.: lvs. very broad: fls. white or very light, in dense globose umbels to 3 in. across. Turkestan.

lineare. Glabrous, with bulbose rhizome, st. cylindrical, to 1½ ft., with lvs. at middle and below: lvs. linear, plane: fls. purple, in a nearly or quite globose umbel. Russia, Siberia.

Moly. To 1½ ft.: lvs. to 2 in. wide: fls. bright yellow, in umbels to 3 in. across. S. Eu.

montanum (*A. senescens*?). To 2 ft.: lvs. ½ in. wide: fls. pale purple, in dense heads. Eu. Var. **glaucum** (*A. baicalense*) is grayish-green. Var. **petræum** (*A. fallax*) grows to 1 ft. high and has narrower lvs.

narcissiflorum (*A. pedemontanum*). To 1 ft.: lvs. ⅙ in. or less wide: fls. rose, in 3–8-fld. umbels. Italy.

neapolitanum (*A. Hermettii*). To 2 ft.: lvs. to 1 in. wide: fls. white with colored stamens, in loose umbels to 3 in. across. S. Eu.

nutans. Glabrous, with long bulb and rhizome, st. usually 2-edged, to 2 ft.: lvs. only at base, broad-linear, shorter than st.: fls. rosy-white, on long pedicels in globose umbel. Siberia.

Nuttallii (*A. Helleri*). Slender, to 1 ft., from mostly solitary small bulb: lvs. flat: fls. rose or white, in umbels on pedicels to ½ in. long. Prairies, S. D. to Ariz.

odorum. To 1½ ft.: lvs. to ¼ in. wide: fls. white often striped green, in many-fld. umbels. Siberia to Japan.

oleraceum. To 3 ft.: lvs. to ⅛ in. wide: fls. greenish tinged with red, in loose umbels. Eu.

Ostrowskianum. Glabrous, with subglobose bulb, st. cylindrical, to 1 ft.: lvs. linear-oblong, plane, soft: fls. rose, on filiform pedicels in many-fld. umbel. Turkestan.

paniculatum. To 2 ft.: lvs. $^1/_{12}$ in. wide, partly cylindrical: fls. white or rose, in loose umbels. Medit. region.

pedemontanum: *A. narcissiflorum.*

peninsulare. To 1 ft. and more, from reticulated bulb: lvs. flat, about as long as scape: fls. 8–20 in umbel, deep rose-purple. Calif. Var. **crispum** (*A. crispum*) has inner segms. of fl. undulate or crisped.

platyspathum. Glabrous, with conical mostly solitary bulb, st. cylindrical, leafy at base, to 10 in.: lvs. plane, broad-linear: fls. rose, in many-fld. nearly globose umbel. Turkestan, Siberia.

polyphyllum. Glabrous, with ovate-oblong bulb, st. cylindrical, leafy below middle, to 1½ ft. high: lvs. plane and long: fls. rose, in dense umbel. Turkestan.

Porrum. LEEK (which see). To 3 ft.: lvs. to 2 in. wide: fls. pinkish, in dense umbels. Cultigen.

recurvatum: *A. cernuum.*

reticulatum: *A. textile.*

Rosenbachianum. Glabrous, with subglobose bulb, st. cylindrical, to 2 ft.: lvs. oblong-lanceolate: fls. purple, in large umbel. Turkestan.

roseum. To 1½ ft.: lvs. to ½ in. wide: fls. rose, in a loose few-fld. umbel to 3 in. across. S. Eu.

rotundum. To 2½ ft.: lvs. to ¾ in. wide: fls. purple, rarely rose or whitish, in globose heads 1 in. across. Eu.

sativum. GARLIC (which see). To 2 ft.: lvs. to 1 in. across: fls. pinkish, in small dense umbels, often with bulbels in cluster. Eu.

Schœnoprasum. CHIVE (which see). Tufted to 2 ft.: lvs. cylindrical and hollow: fls. rose-purple, in many-fld. umbels. Eu., Asia.

Scorodoprasum. ROCAMBOLE. GIANT GARLIC. To 3 ft.: lvs. about ⅓ in. broad, flat and keeled; fls. dark purple, in umbels, often changed to bulblets. Eu., Asia Minor.—The long-pointed cloves or bulbs are used instead of garlic.

senescens: a name of dubious usage; the plant intended in lists is probably *A. montanum.*

stellatum. To 18 in. or more, from finely reticulated bulb: lvs. nearly flat: fls. rose, in umbels on pedicels to ¾ in. long. Ill. to Kans. and north.

Stellerianum. Glabrous, with long mostly aggregated bulbs, st. cylindrical or flattened, to 1 ft.: lvs. semi-cylindrical and somewhat grooved, very narrow, basal: fls. rose, in nearly globose lax umbel. Siberia.

strictum. To 1½ ft.: lvs. to ⅕ in. wide: fls. purple or rose, in upright many-fld. umbels. Eu.

textile (*A. reticulatum*). To 1 ft.: lvs. to ⅙ in. wide: fls. white or pale pink, in several-fld. umbels. Sask. to Ariz.

tricoccum. WILD LEEK. To 1 ft.: lvs. to 2 in. wide: fls. greenish-white, in erect umbels. N. B. to N. C. and Tenn.

urceolatum. Glabrous or scabrous on lvs., bulb ovoid, solitary, st. cylindrical, leafy below middle, to 2 ft.: lvs. linear, hollow: fls. pale bluish to nearly white, in many-fld. umbel. Siberia, Turkestan.

validum. To 2½ ft.: lvs. to ½ in. wide: fls. rose or nearly white, in many-fld. umbels. Ore., Calif., Nev.

victorialis. To 2 ft.: lvs. 1–3 in. wide: fls. white or yellowish, in nodding umbels. Eu., Asia.

viviparum. Glabrous, or scabrous on lvs., bulb nearly globose, st. cylindrical, to about 3 ft.: lvs. linear, somewhat 3-angled: fls. blue, the umbel bulbiferous. Siberia, Turkestan.

ALLOPHYTON. *Scrophulariaceæ.* Three somewhat woody small per. herbs of Mex. and Guatemala: lvs. simple, crowded, opposite, tapering to a sessile or clasping base: fls. bell-shaped, purple and spotted, in close long-peduncled clusters; lobes of corolla shorter than tube. **A. mexicanum** (*Tetranema mexicanum, Penstemon mexicanus*) is sometimes grown under glass for its attractive bloom: lvs. near the ground at the top of a very short st., oblong-obovate, to 6 in. long, nearly entire, glaucous underneath: fls. nearly ½ in. long, many in a cluster on peduncles to 8 in. long.

ALLOPLECTUS (*Crantzia*). *Gesneriaceæ*. Trop. shrubs with opposite lvs., fls. clustered or solitary in the axils having straight or curved tube and 5-lobed limb, and fr. a berry; grown in the greenhouse.

Schlimii. Lvs. ovate or ovate-oblong, to 4 in. long, toothed, violet or purple beneath: fls. yellow and red, 1 in. long, urn-shaped, the calyx red. Trop. S. Amer.

ALLOSURUS: *Pellæa rotundifolia.*

ALLSPICE: *Pimenta officinalis.* **Carolina:** *Calycanthus floridus.*

ALMOND. Two kinds of plants are known as almonds. The one grown in orchards as a fruit-tree is *Prunus communis*, native probably in western Asia. It is grown for the "nut," which is the kernel in the pit or stone. The fruit is a hard dryish drupe, the flesh more or less splitting at maturity and disclosing the stone; the thin flesh is inedible. The bitter almond is employed in certain manufacture. The sweet almond, in which the kernel is edible, is the kind grown pomologically; it may be either soft-shell or hard-shell, the former including the commercial kinds. The almond tree is much like the peach and the culture is in general the same; as it blooms early and is liable to injury from spring frosts, it is grown little in North America outside California. It is about as hardy as the peach. Propagation of named varieties is by budding on seedlings grown from either the soft-shell or hard-shell kinds.

Other almonds are grown for the ornamental bloom. There are showy and double-flowered forms of the common almond, *Prunus communis.* The usual "flowering almonds," however, are little bushes of other species, prized for the spring bloom, single and double, in pink, blush, rose and white. Two species are common, *Prunus triloba* and *P. glandulosa*, and *P. japonica* is sometimes seen. The true dwarf almond is *P. nana*, not much grown: flowers single, pink or white. These various small ornamental almonds are commonly grown on plum stock, and the grower should be diligent to keep down the sprouts from the plum root.

ALMOND, EARTH-: *Cyperus esculentus.* **Indian-:** *Terminalia Catappa.* **Tropical-:** *Terminalia Catappa.*

ALNUS. Alder. *Betulaceæ.* Deciduous monœcious trees and shrubs with alternate toothed lvs., staminate fls. in long catkins and the pistillate in short catkins becoming woody cones with 5-lobed scales; native in the northern hemisphere and the Andes of S. Amer. The bloom is not showy but interesting because it appears in advance of foliage in many species.

Alders are best adapted to moist soils and cool or cold climates. Propagated by seeds dried in the autumn and sown in spring under a light covering; also by cuttings, suckers, and rarer kinds by grafting on potted seedling stocks under glass.

Alnobetula: *A. viridis.*

barbata: *A. vulgaris* var.

californica: *A. rhombifolia.*

communis: *A. vulgaris.*

cordata (*A. tiliacea*). Italian A. Tree to 75 ft.: lvs. broad-ovate, to 4 in. long, heart-shaped at base: cones 1–3. Italy, Corsica.

crispa (*A. Mitchelliana*). American Green A. Shrub to 10 ft.: lvs. ovate, to 3 in. long, rounded at base, aromatic when young: cones 3–6. Lab. to N. C.

firma. Shrub or tree to 10 ft.: lvs. ovate-oblong, to 5 in. long, rounded at base. Japan. Var. **hirtella** grows to 30 ft.

glutinosa: *A. vulgaris.*

hirsuta. Manchurian A. Tree to 60 ft.: lvs. broad-ovate, to 6 in. long, rounded at base, glaucous and reddish-pubescent below: cones 3–4. N. E. Asia, N. Japan.

hybrida: hybrid between *A. vulgaris* and *A. incana.*

imperialis: *A. vulgaris* var.

incana. Speckled A. Shrub or tree to 60 ft.: lvs. ovate, to 4 in. long, rounded at base, glaucous or grayish-green beneath: cones 4–8. Eu., Asia, N. Amer. Var. **acuminata** (var. *laciniata*) has lvs. lobed about half way. Var. **monstrosa** has much flattened branches. Var. **pendula**, branches drooping. Var. **pinnatifida** has small deeply lobed lvs.

incisa: *A. vulgaris* var.

japonica. Tree to 80 ft.: lvs. narrow-elliptic, to 5 in. long, wedge-shaped at base, light green beneath: cones 2–6. N. E. Asia, Japan.

latifolia: *A. rugosa.*

macrophylla: *A. subcordata.*

maritima. Seaside A. Shrub or tree to 30 ft.: lvs. oblong, to 4 in. long, wedge-shaped at base, glossy above, light green beneath: cones 2–4. Del., Md., Okla., on banks of streams and ponds.

Mitchelliana: *A. crispa.*

multinervis: *A. pendula.*

nepalensis. Tree: lvs. elliptic-lanceolate, to 7 in. long: cones in lateral panicles. Himalayas.

oregana: *A. rubra.*

pendula (*A. multinervis. A. firma* var. *multinervis*). Shrub or tree to 30 ft.: lvs. oblong-lanceolate, to 5 in. long: cones in nodding racemes. Japan.

purpurea: probably a form of *A. vulgaris.*

rhombifolia (*A. californica*). White A. To 100 ft. or more: lvs. ovate to nearly orbicular, to 4 in. long, tapering at base. Wash. to Calif.

rotundifolia: *A. vulgaris.*

rubra (*A. oregana*). Red A. Tree to 70 ft.: lvs. ovate, to 5 in. long, truncate at base, grayish-green or glaucous beneath: cones 6–8. Alaska to Ida. and Calif.

rugosa (*A. serrulata. A. latifolia*). Hazel or Smooth A. Shrub or tree to 25 ft.: lvs. elliptic or obovate, to 4 in. long, wedge-shaped at base: cones 4–10. Me. to Fla. and Tex.

serrulata: *A. rugosa.*

subcordata (*A. macrophylla*). Tree to 50 ft.: lvs. ovate or oblong-ovate, to 6 in. long, rounded at base, light green and pubescent on veins beneath: cones 1–4. Caucasus, Persia.

tenuifolia. Mountain A. Tree to 30 ft.: lvs. ovate or ovate-oblong, to 4 in. long, mostly rounded at base, usually yellowish-green. B. C. to Lower Calif. and New Mex.

tiliacea: *A. cordata.*

viridis (*A. Alnobetula*). European Green A. Shrub to 6 ft.: lvs. ovate, to 2½ in. long, broad at base, pale green beneath: cones in racemes. Mts. of Eu.

vulgaris (*A. glutinosa. A. rotundifolia. A. communis*). Black A. Tree to 80 ft., the young growth very sticky: lvs. oval or nearly orbicular, to 4 in. long, broad at base: cones 3–5. Eu., N. Afr., Asia; somewhat escaped in E. N. Amer. Several vars. are in cult., as: **aurea** with yellow lvs.; **barbata** (*A. barbata*), lvs. pubescent beneath; **denticulata**, lvs. finely toothed; **imperialis**, lvs. small, deeply lobed into linear lobes; **incisa** (var. *oxyacanthifolia*), lvs. small, deeply lobed into broad lobes; **laciniata**, lvs. regularly lobed to about middle; **pyramidalis** (var. *pyramidals Birkiana*), of narrow pyramidal habit; **quercifolia**, lvs. with deep irregular lobes; **rubrinervia**, lvs. shining dark green with red veins and petioles; **sorbifolia**, lvs. small, with broad deep lobes.

ALOCASIA. *Araceæ.* Trop. Asian herbs with thick short sts., mostly large arrow- or heart-shaped lvs. which are always peltate when young, sheathed petioles, and unisexual fls. borne on a spadix which is shorter than the spathe; grown in greenhouses for the ornamental often variegated foliage.

In the growing season plants should be given an abundance of water, protected from direct sunlight, and a night temperature of 70°; the latter should never fall below 60° even in winter. Propagated by suckers or cuttings of the roots placed in pots and plunged in sand over bottom heat; also by seed sown in pots and kept in a temperature of about 75°.

argyræa. Lvs. to 1½ ft. long, dark green with silvery sheen, the basal lobes ovate. Trop. Asia.

cuprea. Lvs. to 1½ ft. long and 1 ft. across, purple beneath, above dark metallic shining green, the basal lobes ovate: spathes purple and green. Malaya.

indica. To 6 ft.: lvs. to 15 in. long and 6 in. wide, green, arrow-shaped, margins slightly wavy, the basal lobes ovate: spathes yellowish-green or purplish inside. Malaya. Var. **metallica** (*A. plumbea*) has deep purple lvs. and petioles with a metallic sheen. Var. **variegata** has lvs. and petioles lined or mottled with grayish-white.

Korthalsii (*A. Thibautiana*). St. short: lvs. to 14 in. long and 6 in. wide, olive-green above veined with white and purple beneath: spathes pale green. Malaya.

Lowii. St. short: lvs. to 1½ ft. long and 6 in. wide, olive-green above with pale nerves, dark purple beneath, the basal lobes oblong-triangular; petioles rose-color: spathes whitish-green. Malaya. Var. **Veitchii** (*A. Veitchii*) has lvs. broadly margined with white and white nerves. Java.

macrorhiza. To 15 ft. or more high: lvs. 2 ft. or more long, green, arrow-shaped, the margins wavy: spathes glaucous-green or yellowish. Malaya. Var. **variegata** has lvs. blotched and mottled with white.

megarrhiza: hort. name; perhaps *A. macrorhiza.*

metallica: *A. indica* var.

mortefontanensis. Hybrid between *A. Sanderiana* and *A. Lowii* with green lvs. margined and veined with white and purple beneath.

odora. St. to 2½ ft.: lvs. to 3 ft. long and 2½ ft. wide, arrow-shaped, the margins wavy: spathes glaucous-green or yellowish. Asia.

plumbea: *A. indica* var. *metallica.*

porphyroneura (*A. princeps*). Nearly stemless: lvs. pale green with purplish veins, arrow-shaped, the margins wavy, basal lobes triangular; petioles spotted white and yellow: spathes pale yellow. Malaya.—Another *A. porphyroneura* is a form of *Caladium picturatum.*

princeps: *A. porphyroneura.*

Rodigasiana. Hybrid between *A. regina* and *A. Korthalsii* with grayish-green lvs. purple beneath and with paler veins.

Sanderiana. Lvs. 1½ ft. long and 6 in. wide, shining metallic green above veined with white or pale yellow, purplish beneath, arrow-shaped, the margins deeply sinuate-lobed, basal lobes narrowly triangular; petioles striped with brown: spathes green. Philippines.

Sedeni. Hybrid between *A. cuprea* and *A. Lowii,* having lvs. purple beneath and veined white above.

Thibautiana: *A. Korthalsii.*

Van Houtteana. Hybrid of uncertain parentage, having deep green shining lvs. margined with white.

Veitchii: *A. Lowii* var.

Watsoniana. Lvs. to 2 ft. long and 14 in. wide, green above and purplish beneath margined with white, the basal lobes ovate. Malaya.

zebrina. St. short: lvs. 1½ ft. long, green, arrow-shaped, margins slightly wavy, the basal lobes oblong-triangular; petioles banded with green and white: spathes green and white. Philippines.

ALOE. *Liliaceæ.* Per. succulent herbs with stiff spiny-toothed lvs. and showy red or yellow fls. in mostly elevated racemes or spikes on a stout scape-like st.; sometimes grown in the greenhouse or out-of-doors in the S. for their unusual stiff and fleshy aspect. Not to be confused with agaves which are American but aloes are from the Old World, mostly Afr. As a Latin generic name, Aloe has three syllables; as a vernacular or "common" name it has two syllables.

Aloes are well-known pot subjects and are likely to be conspicuous about public buildings and parks in countries not subject to killing frost. They commonly do well in the same pot for some years when not grown for bloom. Propagated by suckers; sometimes by cuttings of new growths and by seeds when available.

arborea: *A. arborescens.*

arborescens (*A. arborea*). To 15 ft.: lvs. to 2 ft. long and 2 in. wide, at top of trunk: fls. red, 1½ in. long, in dense racemes. S. Afr. Var. **frutescens** is a shrubby form with glaucous lvs.

candelabrum. To 20 ft.: lvs. to 2 ft. long and 3 in. wide: fls. red, 1½ in. long, in racemes borne in a candelabrum-like branching panicle to 2 ft. high. S. Afr.

chinensis: *A. vera* var.

ciliaris. Sts. weak and decumbent, with more or less climbing habit, bearing linear-lanceolate lvs. to 6 in. long and 1¼ in. wide, and bright red fls. with greenish tips about 1¼ in. long, in stalked racemes about 8 in. high. S. Afr.—Rather frequent in greenhouses and in S. Calif.

distans. Sts. procumbent, to 9 in. long: lvs. to 4 in. long and 2 in. wide, glaucous, yellow-spined: fls. red tipped with green, 1¾ in. long, in infl. to 1½ ft. high. S. Afr.

ferox. To 9 ft.: lvs. to 2½ ft. long and 6 in. wide, purplish at margin with yellow-brown teeth: fls. greenish-yellow, 1½ in. long, in infl. to 4 ft. high. S. Afr.

frutescens: *A. arborescens* var.

humilis. Tufted: lvs. to 4 in. long and ¾ in. wide, with white marginal teeth, tuberculate: fls. red tipped with green, 1½ in. long, in racemes to 1½ ft. high. S. Afr.

macrocarpa. Stemless, to 2 ft.: lvs. in a basal tuft, to 14 in. long and 2 in. wide, lined and mottled in cross bands: fls. pale red, 1 in. long, in racemes to 6 in. high. Trop. Afr.

Marlothii. Tree-like, with simple stout st.: lvs. to 2½ ft. long and 7 in. wide, very spiny: fls. red, 1¼ in. long, in one-sided horizontal racemes in a branching infl. S. Afr.

obscura. Short-stemmed: lvs. to 8 in. long and 3 in. wide, lined and spotted with pale green, with spiny cartilaginous margins: fls. red, 1¼ in. long, in infl. to 3 ft. high. S. Afr.

Salm-Dyckiana. To 6 ft., branching: lvs. tufted, to 2½ ft. long and 3½ in. wide, yellowish-margined: fls. light red, 1½ in. long, in panicled racemes to 3 ft. high. S. Afr.

saponaria. Densely tufted, stemless, to 2½ ft.: lvs. 8 in. long and 2½ in. wide, blotched with pale green: fls. red, to 1¾ in. long, in dense many-fld. heads. S. Afr.

soccotrina: *A. succotrina.*

striata. Nearly stemless, to 3 ft.: lvs. 20 in. long and 6 in. wide, with entire white cartilaginous margins: fls. red or yellowish, 1¼ in. long, in panicled umbels. S. Afr. Var. **rhodocincta** has lvs. blotched with white.

succotrina (*A. soccotrina*). To 4 ft., branching: lvs. 20 in. long and 2 in. wide, with white marginal prickles: fls. light red, 1¼ in. long, in racemes. S. Afr.

supralævis. Unbranched, to 6 ft.: lvs. to 2½ ft. long and 6 in. wide, spiny below and with red-brown marginal spines: fls. reddish-yellow, to 1 in. or more long, in racemes about 1 ft. long in a branching infl. S. Afr.

vera. TRUE A. BARBADOS A. To 3 ft.: lvs. thick, to 2 ft. long, in a basal rosette: fls. yellow, nodding, in dense raceme terminating the scape. Medit. region. Var. **chinensis** is a smaller form with red-tinged fls. India.

zebrina. Stemless or nearly so, to 4 ft.: lvs. in a dense rosette, to 1 ft. long and 2½ in. wide, often purplish, blotched with whitish, edged with large red- or brown-tipped teeth: fls. red, 1½ in. long, in racemes 1 ft. or more long. Trop. Afr.

ALOINOPSIS: *Nananthus.*

ALONSOA. Mask-Flower. *Scrophulariaceæ.* Herbs and small shrubs grown as annuals in the garden, or indoors for the attractive winter bloom: fls. red, 2-lipped, in terminal racemes, the corolla with very short tube, turned upside down by the twisting of the st.: lvs. opposite or in whorls of 3: native in trop. Amer.

Propagated from seed, and by cuttings for winter plants. They are all of simple cultural requirements in warm open exposures.

acutifolia (*A. myrtifolia*). Bushy, to 3 ft.: lvs. broad-lanceolate, sharp-toothed: fls. cinnabar-red, upper lip 3–4 times longer than calyx. Peru. Var. **candida** (*A. albiflora*), fls. white

albiflora: *A. acutifolia* var. *candida.*

caulialata. To 1 ft. or more, with 4-angled sts.: lvs. ovate or ovate-lanceolate, toothed: fls. scarlet, upper lip twice as long as calyx. Peru.

compacta: *A. Warscewiczii.*

grandiflora: *A. Warscewiczii.*

incisifolia. To 2 ft.: lvs. oval or ovate-lanceolate, deeply cut-toothed: fls. scarlet, purple-black in throat, upper lip 2–4 times longer than calyx. Peru.

linearis (*A. liniflora*). Bushy, much branched, to 1½ ft.: lvs. linear, fine-toothed or entire: fls. numerous, scarlet. Peru. Var. **gracilis** (*A. pumila*), smaller and graceful.

liniflora: *A. linearis.*

linifolia. To 1½ ft.: lvs. linear, entire: fls. scarlet, large. Peru.

meridionalis (*A. Mutisii*). Similar to *A. caulialata* but with uniformly dull orange fls. about ¼ in. long. Colombia.

Mutisii: *A. meridionalis.*

myrtifolia: *A. acutifolia.*

pumila: *A. linearis* var. *gracilis.*

Warscewiczii (*A. compacta. A. grandiflora*). Very bushy, to 3 ft.: lvs. ovate-lanceolate, toothed: fls. cinnabar- or scarlet-red, upper lip 4–5 times longer than calyx. Peru.

ALOPECURUS. *Gramineæ.* Ann. and per. grasses resembling timothy and grown in meadows, the spikelets crowded into dense narrow spikes; native mostly in the north temp. zone. See *Grasses.*

pratensis. Meadow Foxtail. Per. to 3 ft.: lvs. to 6 in. long and ¼ in. wide, rough: spikes to 3 in. long, above the foliage, florets awned. Eu.; nat. in E. N. Amer.—Lower grass than timothy, with shorter spikes and many awns.

ALOYSIA: *Lippia.*

ALPHITONIA. *Rhamnaceæ.* Probably a single species, a tall tree with alternate lvs., fls. ¼ in. or less across, in forking cymes, and fr. a dry drupe-like body the outer part of which often falls and leaves the 2 or 3 seeds standing on the torus. **A. excelsa.** Lvs. ovate to lanceolate, to 6 in. long, entire, leathery, white-tomentose beneath. Australia. Occasionally planted in S. Calif. for ornament.

ALPINES. The word *alpine* denotes narrowly pertaining to the Alps, but usage allows its application to any very high mountain regions. Alpine plants are particularly those that grow above the tree-line, but in common writing and speech the term is too frequently employed for mountain plants in general, and alpine-gardening is likely to mean only rock-gardening. The real alpine-gardening attempts to make an approximate imitation of alpine conditions; it is possible in cool places, with good supply of cold water, and soils something like those of alpine places. The selection of plants requires experience and the handling of them demands skill. The growing season is short. True alpine-gardening is little attempted in North America.

ALPINIA. *Zingiberaceæ.* Per. herbs with leafy sts. and often showy fls. in terminal spikes or panicles, having 1 petal-like staminode or lip.

Grown for ornamental foliage and habit in the tropics and subtropics or in a moist greenhouse with a temperature of 60°. They require abundant watering. Propagated by division in spring; the plants make large clumps. Some of the kinds have striped leaves. See *Zingiberaceæ.*

calcarata. To 5 ft.: lvs. to 1 ft. long and 2 in. wide: fls. greenish-white, the lip variegated with red and yellow, in dense panicles to 4 in. long. India.

formosana. Lvs. to 16 in. long and 3 in. wide: fls. with crinkled lip 1 in. long, in panicles to 6 in. long. Formosa.

mutica. To 6 ft.: lvs. to 16 in. long and 1¾ in. wide: fls. white, the lip yellow marked with red, in panicles to 7 in. long. Malay Peninsula.—The material cult. under this name may not be this species.

nutans: *A. speciosa.*

Sanderæ (*A. vittata*). Lvs. to 8 in. long and 1 in. wide, striped and marked with clear white. Botanical position uncertain; plant sterile; frequent in cult.

speciosa (*A. nutans. Renealmia nutans. Languas speciosa*). Shell-Flower. To 12 ft.: lvs. to 2 ft. long and 5 in. wide: fls. white tinged with purple, the lip crinkled and yellow variegated with red and brown, fragrant, in pubescent racemes which become nodding. E. Asia.—Commonly planted in warm regions.

tricolor. Like *A. Sanderæ* except that the lf.-markings are yellowish-white.

vittata: *A. Sanderæ.*

vitellina (*Amomum vitellinum*). To 3 ft.: lvs. to 16 in. long and 3 in. wide: fls. yellow, the lip crisped and marked with red, in panicles to 3½ in. long. Malacca.

ALSEUOSMIA. *Caprifoliaceæ.* New Zealand evergreen shrubs with alternate lvs., tubular or funnelform fragrant fls. solitary or clustered in the axils, and crimson berries; one species may be planted in S. Calif.

macrophylla. To 8 ft., glabrous: lvs. obovate to linear-oblong, to 7 in. long: fls. crimson, to 1½ in. long: berries ½ in. long.

ALSINE: see *Arenaria* and *Stellaria.*

ALSOPHILA. Tree-Fern. *Cyatheaceæ.* Tree-ferns with large finely divided lvs. light green in color, the stipes covered with scales, spiny or smooth, with naked sori on back of segms.; mostly tropical. See *Ferns.*

australis. To 20 ft., trunk straight bearing a spreading head of 2–3-pinnate lvs. to 12 ft. long; segms. to 6 in. long and 1 in. wide. Australia.—Rather common under glass.

dealbata: *A. glauca;* sometimes *Cyathea dealbata.*

glauca (*A. dealbata*). Very tall, prickly: lvs. glaucous beneath, segms. to 5 in. long and 1 in. wide. Trop. Asia.

ALSTONIA. *Apocynaceæ.* Trees or shrubs with mostly whorled lvs., salver-shaped fls. in corymbose cymes, and fr. of 2 linear follicles; native Malaya to Pacific Isls.

scholaris. Devil-Tree. Pali-Mara. To 60 ft. and more: lvs. narrow-oblong to oblanceolate, verticillate, to 8 in. long, with many parallel side-veins: fls. pubescent, white, in thyrses: pods very long and slender. India.

venenata. To 8 ft. or more, glabrous: lvs. oblong-lanceolate, to 8 in. long: fls. white, 1 in. across: frs. to 5 in. long. India.

ALSTRŒMERIA. *Amaryllidaceæ.* S. American herbs with thick fibrous roots, leafy sts., and showy red, yellow or purple fls. in terminal umbels, the perianth-segms. distinct.

Alstrœmerias are probably not hardy in the North except *A. aurantiaca*, but may be planted out in spring, lifted after blooming, and stored over winter. They should be set in shady positions in rich moist soil. Also may be grown as pot-plants in the greenhouse but should be lifted and shaken out annually. Propagated by division of roots and by seeds.

aurantiaca (*A. aurea*). To 3 ft.: lvs. lanceolate, to 4 in. long: fls. bright yellow spotted with brown, 1½ in. long. Chile.

aurea: *A. aurantiaca.*

brasiliensis. To 4 ft.: lvs. oblong-lanceolate, 2 in. long: fls. reddish-yellow spotted with brown, 1¼ in. long. Brazil.

chilensis. To 4 ft.: lvs. obovate to lanceolate, fringed: fls. rose or red. Chile.

hæmantha. To 3 ft.: lvs. lanceolate to linear, to 4 in. long, glaucous beneath: fls. reddish-yellow spotted purple and tipped green, to 2 in. long. Chile. Var. rosea has rose fls.

Pelegrina. To 2 ft.: lvs. lanceolate, to 2 in. long: fls. lilac spotted with red-purple, to 2 in. long. Chile. Var. alba has white fls.

pulchella. To 3 ft.: lvs. lanceolate, to 3 in. long: fls. dark red tipped with green and spotted with brown. Brazil.

revoluta. To 1 ft.: lvs. linear, to 1½ in. long: fls. purplish, yellowish and spotted within, to ¾ in. long. Chile.

versicolor. To 1 ft.: lvs. linear, 1 in. long: fls. yellow spotted with purple, 1 in. long. Chile.

ALTERNANTHERA. *Amaranthaceæ.* Probably nearly 100 herbs or shrubs of warm or trop. countries, a few of which are grown as carpet-bedding subjects. The species in cult. are placed in the genus Achyranthes by some authors and in Telanthera by others. In gardens the plants are commonly known as Alternantheras. The hort. kinds are low compact herbs of the New World tropics with small opposite entire variously colored and variegated lvs.: fls. minute, in small dense axillary clusters, but in cult. the plants are not often allowed to reach the blooming stage.

Alternantheras are usually kept only 6 inches high by shearing. They grow best in warm sunny situations. The plants are propagated by division or by cuttings; the latter are usually made from strong plants in the garden in August, wintered over in hotbeds or the greenhouse and potted off in March or April. Division requires less time; the plants, after the first frost, are lifted and cut back to 3 or 4 inches; in early spring they are divided, the rooted shoots potted or placed in flats with plenty of room; in four to six weeks they should be ready for bedding-out.

amœna. Very dwarf: lvs. lanceolate to elliptic, green veined and blotched with red and orange. Brazil. Here belong the garden forms amabilis, spectabilis, rosea.

Bettzickiana. Lvs. narrow-spatulate, blotched and colored in many shades cream-yellow to red. Brazil. Most of the cult. forms belong here, as aurea, aurea nana compacta, magnifica. Var. typica is 2–3 in. tall, lvs. olive-colored, upper red at apex. Var. spathulata, to 8 in., with red lvs. and st.

paronychioides of hort.: *A. Bettzickiana.*

philoxeroides. Usually decumbent: lvs. obovate to lanceolate, very short-stalked. Brazil.

versicolor. Copper A. Lvs. round-spatulate, copper- or blood-red. Brazil.

ALTHÆA. *Malvaceæ.* Tall straight leafy-stemmed pubescent or tomentose annuals, biennials and perennials with fls. in terminal erect racemes or spikes, grown in gardens for their showy bloom; native in the temp. regions of the Old World.

The perennials are given the usual cultivation. The biennials, especially *A. rosea*, are planted most often in July and transplanted to their permanent quarters the following spring. A new strain, sold as "annual hollyhocks," produces bloom the first summer by sowing the seed indoors in February.

ficifolia. Figleaf or Antwerp Hollyhock. Bien. to 6 ft.: lvs. deeply 7-lobed and toothed: fls. lemon-yellow or orange, in terminal spikes, single or double, to 3 in. and more across. Eu.

frutex: *Hibiscus syriacus.*

officinalis. Marsh-Mallow. Per. to 4 ft.: lvs. 3-lobed or unlobed, tomentose: fls. 1 in. across, blush or rose, in axillary clusters. E. Eu.; escaped in coast marshes in N. Amer.

rosea. Hollyhock. Hairy bien. or semi-per. to 9 ft.: lvs. 5–7-lobed or -angled: fls. in long spike or wand-like raceme, red, rose, pink, yellow, white, to 3 in. and more across. China.—There are double vars. See *Hollyhock.*

ALTHEA, SHRUB-: *Hibiscus syriacus.*

ALUM-ROOT: *Heuchera.*

ALYSSUM. Madwort. *Cruciferæ.* Ann. and per. mostly gray herbs and subshrubs: lvs. small, alternate on the st., sometimes making rosettes at base: fls. small, yellow or white, in terminal short racemes or clusters: pods or silicles short, nearly or quite orbicular in outline. Species about 100, in Eu. and W. Asia.

A few are grown in rock-gardens and borders, in open or sunny situations. They require the usual culture for perennials and are propagated by seed or by division of the roots.

alpestre. Variable gray tufted per. 3 or 4 in. high: lvs. obovate or oblong to linear, about ¼ in. long: fls. yellow, in short racemes. Eu.—Some of the plants known as *A. serpyllifolium* probably belong here.

alyssoides (*A. calycinum*). Ann., mostly branching at base, to 10 in. high: lvs. narrow-oblong to spatulate, usually under 1 in. long, grayish-canescent: fls. yellowish-white, in narrow terminal racemes. Eu.; nat. in N. Amer.

argenteum. Yellow-Tuft. Per., dwarf, dense, woody at base, 15 in. high: lvs. oblanceolate to spatulate, silvery-tomentose underneath: fls. deep yellow, in clustered heads, all summer. Eu.—Incorrectly known also as *A. rostratum.*

Benthami: *Lobularia maritima.*

calycinum: *A. alyssoides.*

compactum: *A. saxatile* var.; also *Lobularia maritima* var.

creticum. Woody per., 1 ft. or less: lvs. obovate-oblong and obtuse, silvery: fls. rather large, yellow, in short racemes. Crete.

gemonense. Whitish per. woody at base, 1 ft. or less: lvs. oblong-oblanceolate to spatulate, to ½ in. broad: fls. yellow, in short clusters, the petals notched. S. Eu.

giganteum: *Lobularia maritima.*

idæum. Silvery-green per. with short simple sts.: lvs. ovate-oblong: fls. whitish, in short panicle. Crete.

incanum: *Berteroa incana.*

leucadeum. Per. to 15 in., leafy, silvery-gray: lvs. broad-linear, obtuse, entire, to 3 in. long: fls. yellow, in racemes: pod orbicular and flattish. Italy.

maritimum: *Lobularia maritima.*

minimum: *Lobularia maritima* var.

Moellendorfianum. Per., silvery: lower lvs. more or less spatulate, the upper ones ovate, all obtuse and

½ in. or so long: fls. yellow, in an umbel-like head. Bosnia.

montanum. Per. to 10 in., but commonly low and compact: lvs. obovate-oblong to linear, grayish-canescent: fls. yellow, fragrant, in short clusters elongating in fr. Cent. and S. Eu., Caucasus.

podolicum: *Schivereckia podolica.*

pyrenaicum. Dwarf shrublet without spines: lvs. obovate, white-tomentose: fls. white, anthers dark. Pyrenees.

repens. Low per. much like *A. montanum* but with larger orange fls. S. E. Eu.

rostratum: see *A. argenteum.*

saxatile. Golden-Tuft Gold-Dust. Basket-of-Gold. Rock M. Spring-flowering per. forming a spreading mat, woody at bottom: lvs. oblanceolate to somewhat spatulate, mostly with few obscure teeth, grayish, the greater part basal and 2–4 in. long: fls. golden-yellow, in racemes on branching sts. Cent. and S. Eu. Several vars. are in cult.: **compactum**, Dwarf G.; **compactum flore-pleno**; **flore-pleno**; **luteum** (*citrinum, sulphureum*); Silver Queen, palest yellow; **variegatum.**

serpyllifolium: see *A. alpestre.*

spinosum. Woody and spiny, to 1 ft., silvery: lvs. long-lanceolate, to 2 in. long: fls. white or pinkish, in short racemes. S. Eu., N. Afr.

Wierzbickii: *A. rostratum* of botanists, an ann. probably not cult.; *A. rostratum* of hort. is *A. argenteum.*

Wulfenianum. Gray-canescent per. differing from *A. montanum* mainly in the smooth pod twice as large. S. Eu.

ALYXIA (*Gynopogon*). *Apocynaceæ.* Trop. evergreen woody plants in many countries with mostly fragrant fls. and glossy whorled or opposite lvs.: corolla salverform, the cylindrical tube swollen above the middle or contracted at throat: fr. a drupe. Propagated by seeds and cuttings.

olivæformis. Maile. Somewhat twining glabrous shrub: lvs. ovate to oblong, to 2 in. or more long, entire: fls. yellowish, mostly 4-lobed, to 2½ in. long, very fragrant. Hawaii, where it is much prized in garlands or leis.

AMARANTH: *Amaranthus.* **Globe**: *Gomphrena globosa.*

AMARANTHACEÆ. Amaranth Family. Mostly herbs of wide distribution, with opposite or alternate lvs., small unisexual or bisexual fls. subtended by dry scales, usually showy in mass, having small 2–5-parted perianth, 1–5 stamens, superior ovary, and fr. a utricle, achene or berry-like. Many of the genera are weedy, but some species are grown for ornament and pot-herbs, as Achyranthes, Ærva, Amaranthus, Bosea, Celosia, Deeringia, Frœlichia, Gomphrena, Iresine, Nototrichium. All are of simple cult., grown from seeds and from soft cuttings, and prefer open sunny positions.

AMARANTHUS. Amaranth. *Amaranthaceæ.* About 50 coarse annuals native in mild and trop. climates in many parts of the world, some of them widely distributed as weeds of tilled lands and waste places; a few of them are cult. for the colored foliage and the heavy red spikes, and in some countries grown for greens: fls. minute and unshowy, in chaffy often colored heads or spikes: lvs. alternate, in ours broadly ovate or oval unless otherwise noted.

The species grow readily from seeds; sunny positions are best; the leaf colors are likely to be less brilliant in very fertile soils. Some of the weedy kinds may be grown in collections for general interest.

abyssinicus: *A. caudatus.*

atropurpureus: *A. caudatus.*

bicolor: *A. tricolor.*

caudatus (*A. cruentus. A. paniculatus*). Love-Lies-Bleeding. Tassel Flower. Stout, branching, upright, 3–5 ft., with large colored showy coarse erect or somewhat nodding panicle which may be open and graceful or thick and clumpy. Tropics; commonly cult. and sometimes spontaneous.—Variable; the effort to distinguish two species, *A. caudatus* and *A. cruentus*, does not hold. Garden plants known as *A. abyssinicus, atropurpureus, Dussii, elegantissimus, Margaritæ, monstrosus, sanguineus, superbus*, belong here.

chlorostachys: *A. hybridus.*

coleifolius: *A. tricolor.*

cruentus: *A. caudatus.*

Dussii: *A. caudatus.*

elegantissimus: *A. caudatus.*

gangeticus: *A. tricolor.*

Henderi: *A. tricolor* var. *angustior.*

hybridus (*A. chlorostachys*). Common tall weed, usually with green herbage, but sometimes reddish but plants not showy. Var. **hypochondriacus.** Princes-Feather. The cult. form, with many-branched showy panicles, red or brownish-red, the branches slender and graceful, short and erect or only somewhat spreading, terminal one erect or curving from the middle: bracts very sharp, about twice exceeding calyx: herbage usually reddish. Tropics.

hypochondriacus: *A. hybridus* var.

Margaritæ: *A. caudatus.*

melancholicus: *A. tricolor.*

monstrosus: *A. caudatus.*

paniculatus: *A. caudatus.*

salicifolius: *A. tricolor* vars.

sanguineus: *A. caudatus.*

splendens: *A. tricolor* var.

superbus: *A. caudatus.*

tricolor (*A. gangeticus. A. melancholicus*). Erect, mostly much branched, 1–4 ft.: fl.-clusters small, globular, sessile in axils of lvs. or the upper ones 1 or 2 in. long and interrupted and contiguous in a narrow panicle-like infl.: lvs. oval or ovate, the main ones 2½–4 in. broad, often blotched and colored and the plants then sometimes known as Josephs-Coat (*A. bicolor, A. coleifolius*) and brilliant forms as "Combustion," "Molten Fire," "Sunshine" etc. Tropics; grown in the Orient for greens. Var. **angustior** (*A. salicifolius* partly. *A. Henderi*). Plant usually slender: lvs. mostly 1–1½ in. broad. Var. **angustissimus** (*A. salicifolius* partly). Lvs. long-linear or nearly so, usually not surpassing ½ in. in width, often drooping. Var. **splendens** (*A. splendens*) is rich red with brilliant light red foliage at top of plant.

AMARCRINUM. *Amaryllidaceæ.* As the name indicates, a hybrid between the genera Amaryllis and Crinum. **A. Howardii**, recorded as *A. Belladonna* crossed with pollen of *C. Moorei:* fls. soft pink, somewhat fragrant, open funnelform with recurving segms. and declinate style, borne in very large clusters on sts. to 4 ft. long, of lasting quality. Produced in Calif., where it blooms in the open in summer and autumn; suitable also for pot cult. An earlier hybrid in Eu. of similar parentage has been called *Crinodonna.*

AMARYLLIDACEÆ. Amaryllis Family. Over 70 widely distributed genera of per. herbs having bulbous or fibrous roots or rhizomes, usually bisexual fls. with 6-parted perianth, 6 stamens and inferior 3-celled ovary, and fr. a caps. or berry. The family furnishes many choice ornamental subjects as well as medicinal products and fiber. Those treated herein are: Agave, Alstrœmeria, Amarcrinum, Amaryllis, Ammocharis, Anigozanthos, Bomarea, Brunsvigia, Clivia, Cooperia, Crinodonna, Crinum, Curculigo, Doryanthes, Eucharis, Furcræa, Galanthus, Hæmanthus, Hippeastrum, Hymenocallis, Hypoxis, Leucojum, Lycoris, Manfreda, Narcissus, Nerine, Pancratium, Polianthes, Sprekelia, Sternbergia, Vallota, Zephyranthes. Many of these plants bear lily-like fls., but the family differs from the Liliaceæ in having inferior rather than superior ovary.

AMARYLLIS. *Amaryllidaceæ.* One S. African bulbous herb with large lily-like fls., grown in pots or planted out in warm climates: peduncle or scape solid (not hollow). The bulbs should be stored in a dry cool place during the winter in cold climates, then repotted in a mixture of fibrous loam, leaf-mold and sand and placed in a warm position. Liquid manure should be applied when the fls. develop. Most of the plants known as amaryllis in cult. are hippeastrums and other genera.

Atamasco: *Zephyranthes Atamasco.*

aurea: *Lycoris aurea.*

Belladonna. BELLADONNA-LILY. Lvs. strap-shaped, appearing before or after the fls. which bloom in summer or autumn: fls. rose-red, to 3½ in. long, fragrant, in umbels at top of solid scape to 2 ft. high.—There are many color forms from purple to white.

equestre: *Hippeastrum puniceum.*

formosissima: *Sprekelia formosissima.*

Hallii: *Lycoris squamigera.*

Johnsoni: *Hippeastrum Johnsoni.*

Josephinæ: *Brunsvigia Josephinæ.*

longifolia: *Crinum longifolium.*

lutea: *Sternbergia lutea.*

purpurea: *Vallota speciosa.*

radiata: *Lycoris radiata.*

Reginæ: *Hippeastrum Reginæ.*

reticulata: *Hippeastrum reticulatum.*

sarniensis: *Nerine sarniense.*

vittata: *Hippeastrum vittatum.*

AMASONIA. *Verbenaceæ.* Trop. American subshrubs with scattered lvs. and yellow fls. in clusters which are racemed or panicled; grown in the greenhouse the same as Clerodendrum, but little known to gardeners.

calycina. Lvs. to 1 ft. long, irregularly toothed: fls. drooping, to 2 in. long. British Guiana.

punicea. The plant known to hort. under this name is probably *A. calycina.*

AMATUNGULA: *Carissa grandiflora.*

AMBARELLA: *Spondias cytherea.*

AMBERBOA (*Volutarella*). *Compositæ.* Herbaceous annuals sometimes grown in flower-garden, with alternate jagged-toothed or pinnately-cut lvs. and purple, violet or blue heads: fls. all tubular, outer row sterile; pappus of scales. Native in Medit. region, W. Asia and India.

muricata (*Centaurea muricata*). To 2 ft.: lvs. lanceolate: heads pink or purple. Spain, Morocco.

AMBROSIA MEXICANA: *Chenopodium Botrys.*

AMELANCHIER. SERVICE-BERRY. JUNEBERRY. SHADBUSH. *Rosaceæ.* Deciduous showy shrubs or small trees of the north temp. zone, with alternate toothed lvs., white fls. mostly in terminal racemes, and fr. a small dark blue or black pome, sometimes edible. Desirable because of the abundant bloom in early spring, mostly preceding the foliage; also plants of good habit and attractive fr.

Amelanchiers are hardy in the North and do well on a variety of soils. Propagated by seeds sown when ripe or stratified, by suckers when produced, or rare kinds by budding. See also *Juneberry.*

alnifolia. To 7 ft., stoloniferous: lvs. obtuse, densely pubescent beneath when young: racemes erect, to 1½ in. long. Sask. to Colo.

asiatica. To 40 ft.: lvs. acute, densely white-tomentose beneath when young: racemes nodding. Japan, Korea; hardy N.

canadensis. To 30 ft.: lvs. acute or acuminate, tomentose on both sides when young: racemes nodding, to 2 in. long, fls. before lvs. Me. to Ga. and La.

florida. To 15 ft.: lvs. obtuse, becoming glabrous beneath: racemes erect, to 3 in. long. Mich. to Wash.

lævis. To 40 ft.: lvs. short-acuminate, quite glabrous, purplish when young: racemes nodding. Newf. to Ga. and Ala.

oblongifolia. To 25 ft.: lvs. oblong, obtuse or acute, white-tomentose beneath when young: racemes erect, short. Me. to S. C.

ovalis (*A. rotundifolia. A. vulgaris*). To 8 ft.: lvs. obtuse, tomentose beneath when young: racemes erect. Eu.—Differs from other species in the styles free and very short.

rotundifolia: *A. ovalis.*

stolonifera. To 4 ft., spreading by underground stolons and forming patches or colonies: lvs. elliptic to nearly orbicular, serrate toward apex, at first white-pubescent beneath: fr. purplish, with bloom, sweet, sepals mostly recurved. Newf. to Mich. and Va.—Cult. as Dwarf Juneberry.

vulgaris: *A. ovalis.*

AMELLUS. *Compositæ.* S. African herbs with oblong lvs. and blue-rayed fls. in many-fld. solitary heads; disk-fls. with double pappus of scales and bristles; one species sometimes planted in the flower-garden.

annuus (*A. strigosus* var. *Willdenovii*). Ann., diffuse or prostrate: lvs. to 2 in. long, usually with 1 tooth on each side.

AMESIA. *Orchidaceæ.* Terrestrial orchids with creeping rootstocks, leafy sts. and fls. in terminal racemes, the sepals and petals similar, the lip free; sometimes grown in the wild-garden.

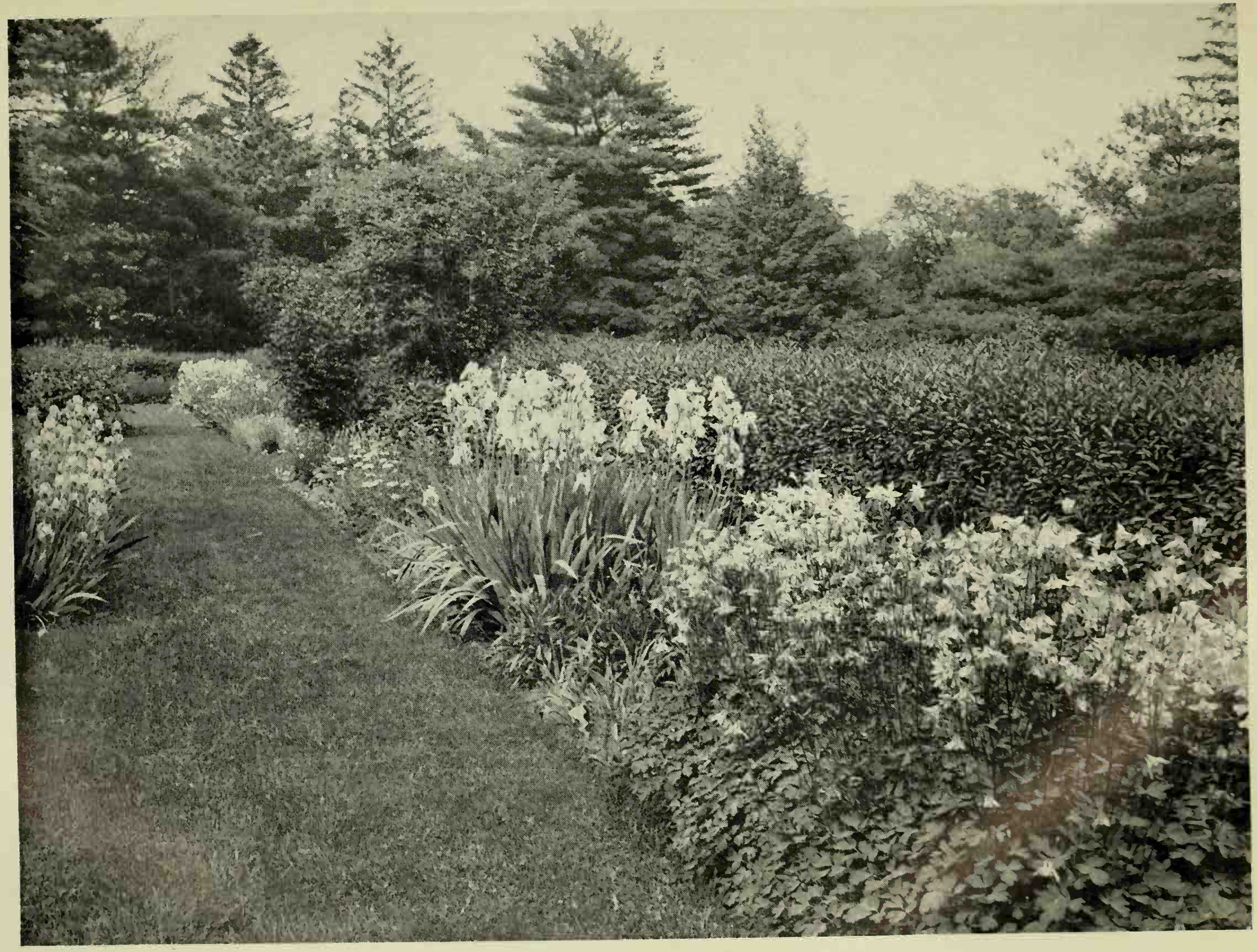
gigantea (*Epipactis gigantea. Serapias gigantea*). To 3 ft.: lvs. to 6 in. long: fls. greenish-rose striped with dark red, about 1 in. across, July–Aug. W. N. Amer.

AMHERSTIA. *Leguminosæ.* One showy Indian tree, **A. nobilis,** reaching 40 ft. in height, with large pinnate lvs., the lfts. to 1 ft. long, pendulous long racemes of bright red and yellow fls. with 2 red petal-like bracts at base of calyx-tube, upper petal 2 in. broad, staminal column prominent; pods woody, to 7 in. long and 2 in. wide.—It requires rich well-drained soil and a trop. moist climate; propagated by layering or cuttings of half-ripened wood over bottom heat.

AMIANTHIUM. *Liliaceæ.* Per. bulbous herbs having linear lvs. and small white fls. in terminal racemes, the perianth-segms. distinct; sometimes grown in the wild-garden. Propagated by division or rarely by seeds.

angustifolium: *Zygadenus angustifolius.*

muscætoxicum (*Zygadenus muscætoxicus. Chrosperma muscætoxicum*). FLY-POISON. To 4 ft. high: lvs. to 2 ft. long and 1 in. wide: racemes to 5 in. long. N. Y. to Fla. and Ark.



II. Borders. — A well-bordered walk; columbines and irises now dominant

AMICIA. *Leguminosæ.* Shrubs or subshrubs with alternate pinnate lvs., yellow papilionaceous fls. mostly in racemes, and fr. a narrow flat pod; native Mex. to Bolivia. One species is sometimes planted in S. Calif.

Zygomeris. To 8 ft.: lfts. 4 or 6, wedge-shaped, to 2½ in. long, glandular-dotted: fls. to 1½ in. long, subtended by large bracts. Mex.

AMMOBIUM. *Compositæ.* Australian per. herbs grown as everlastings or immortelles, with yellow fls. in solitary heads surrounded by involucre of silvery-white bracts; pappus of few teeth.

Of easy cultivation, sometimes treated as a biennial when the seed is sown in September, but may be grown as an annual with seeds sown in spring. Flowers remain white if cut before full bloom and hung in shady airy place to dry.

alatum. WINGED EVERLASTING. To 3 ft., white-woolly, the branches winged: lvs. mostly basal: heads to 2 in. across. Var. **grandiflorum** has larger heads.

AMMOCALLIS: *Vinca rosea.*

AMMOCHARIS. *Amaryllidaceæ.* Two S. African bulbs, one of which may be cult. **A. falcata.** To 1 ft.: lvs. to 2 ft. long and 1 in. wide: fls. bright red, fragrant, in many-fld. umbels terminating a flat solid scape, the perianth-segms. clawed and reflexed.—It may be grown in pots in the greenhouse or planted out and the bulbs stored in winter. It blooms in summer or autumn or in winter under glass; requires rich loamy soil.

AMMOPHILA. *Gramineæ.* Per. grasses with creeping rootstocks, one useful as a binder in sandy soil, particularly along seacoasts: lvs. long and stiff: spikelets in dense spike-like panicles: native along shores in the northern hemisphere. See *Grasses.*

arenaria. EUROPEAN BEACH-GRASS. SEA SAND-REED. MARRAM. To 4 ft.: lvs. to 1 ft. long, rolled inward, rough above, the ligule to 1 in. or more long: panicles to 1 ft. long and ½ in. thick. Eu.; intro. on Pacific Coast.—Propagated by rootstocks.

breviligulata. AMERICAN BEACH-GRASS. The plant of shores and dunes of the Atlantic Coast and Great Lakes, formerly confused with the European species, is a larger plant, with longer panicle and very short ligules: a good sand-binder.

AMOLE: *Chlorogalum pomeridianum.*

AMOMIS CARYOPHYLLATA: *Pimenta acris.*

AMOMUM. *Zingiberaceæ.* Per. herbs with creeping rootstocks, leafy sts. and fls. in dense cone-like spikes beneath the foliage, having 1 petal-like staminode or lip.

Grown as foliage plants in warm regions; sometimes seen in economic collections under glass, as some of the species yield medicinal products. See *Elettaria.* They require rich soil and abundant moisture. Propagated by division in spring. See *Zingiberaceæ.*

Cardamon. To 8 ft.: lvs. to 10 in. long and 3 in. wide: fls. yellow. E. Indies.

vitellinum: *Alpinia vitellina.*

AMORPHA. FALSE INDIGO. *Leguminosæ.* Shrubs bearing alternate pinnate lvs. with small lfts., small fls. in dense terminal spikes, and short slightly curved pods; native in N. Amer. and Mex.

Grown for ornament out-of-doors. Propagated by seeds, greenwood cuttings under glass, hardwood cuttings planted in sheltered position in autumn and left for a year, suckers or layers. The cultivated species are mostly hardy North.

angustifolia: *A. fragrans.*

canescens. LEAD-PLANT. To 4 ft., plant usually densely white-hairy: lfts. to ¾ in. long: fls. blue, in spikes to 6 in. long, July–Aug. Man. to La. and New Mex.

fragrans (*A. angustifolia*). To 1 ft.: lfts. to 1½ in. long: fls. purple-blue, in racemes to 6 in. long, June. Ill. to Tex.

fruticosa. BASTARD INDIGO. To 20 ft.: lfts. to 1½ in. long: fls. dark purple, varying to pale blue and white, in spikes to 6 in. long, May–June. Sask. to Fla. and Mex. Var. **crispa** has lfts. with curled edges. Var. **croceo-lanata**, young parts yellow-pubescent.

glabra (*A. montana*). To 6 ft.: lfts. to 2 in. long: fls. blue, in racemes to 6 in. long, in spring. N. C. to Ga. and Ala.

herbacea. To 4 ft., grayish-pubescent: lfts. to 1 in. long: fls. violet-purple varying to white, the spikes clustered, to 1 ft. long, in spring. N. C. to Fla.

microphylla: *A. nana.*

montana: *A. glabra.*

nana (*A. microphylla*). To 1 ft.: lfts. to ½ in. long: fls. purplish, in racemes to 6 in. long, in spring. Minn. to Rocky Mts.

nitens. To 9 ft.: lfts. to 2½ in. long, shining: fls. in racemes to 10 in. long, in summer. Ga.

tennesseensis. To 20 ft.: lfts. to 1 in. long: fls. violet-purple, in racemes to 6 in. long, in spring and summer. Tenn.

AMORPHOPHALLUS. *Araceæ.* Very large herbs native in trop. Asia, with tuberous roots, large 3-parted lvs. with the segms. pinnately cut, and unisexual fls. borne on an upright spadix surrounded by a conspicuous spathe; grown as curiosities in the greenhouse. The fls. have a disagreeable odor and appear in advance of lvs.

Plants thrive in a rich loamy soil and should be kept dry and warm in winter. Propagated by offsets of the tubers potted singly and kept in a temperature of 65–70°. Grown in greenhouses and sometimes in tubs for summer bloom, or planted out in mild climates.

campanulatus. To 2 ft.: lvs. to 3 ft. long and broad, the petioles spotted with white: spathes ovate, 8 in. long and 10 in. across, fleshy below spotted with white, purplish in center, with wavy margins; spadix about 10 in. long. E. Indies.

giganteus. Lvs. 3 ft. or more broad, pale green, the petioles variegated with white: spathes broadly ovate, 1 ft. long and 8 in. across, clouded with purple, the margins wavy; spadix slightly shorter than spathe. Malaya.

Rivieri: *Hydrosme Rivieri.*

AMPELODESMA. *Gramineæ.* One per. tufted grass with stiff erect sts. to 5 ft. tall, grown for ornament in Calif. **A. mauritanicus** (*A. tenax*). Lvs. very long and narrow, becoming convolute, rough on edges: spikelets in long loose one-sided nodding panicles. Medit. region. See *Grasses.*

AMPELOPSIS. *Vitaceæ.* Tendril-climbing shrubs native in N. Amer. and Asia, with alternate simple or compound lvs., small greenish fls. in long-stalked cymes, and fr. a berry. In Ampelopsis the tendrils do not bear expanded disk-like tips and the disk in the fl. is separate from the ovary and prominent, thus differing from Parthenocissus.

Ampelopsis is grown as a covering for walls and arbors, and is not particular as to soil. Propagated by seeds, also by cuttings and layers. Cuttings of hard wood may be made in September under glass or stored until spring after the manner of grape cuttings; those of soft wood can be struck in the summer.

aconitifolia (*A. dissecta. A. aconitifolia* var. *dissecta*). Lvs. of 3 or 5 lanceolate pinnately lobed lfts. to 3 in. long: fr. orange or yellow, sometimes bluish when young. China. Var. **palmiloba**, lvs. 3-parted and segms. toothed and lobed. See note under *Vitis vinifera*.

arborea (*A.* and *Vitis bipinnata. Cissus arborea*). PEPPER-VINE. Lvs. bipinnate, lfts. ovate, to 1½ in. long, coarsely toothed: fr. dark purple. Va. to Fla. and Mex.

bipinnata: *A. arborea.*

brevipedunculata (*A. heterophylla* var. *amurensis*). Lvs. cordate-ovate, to 5 in. long, with 3 coarsely toothed lobes: fr. lilac becoming blue. N. E. Asia. Var. **citrulloides**, lvs. deeply 5-lobed. Var. **elegans** (*A. variegata*), lvs. variegated with white, green or pink. Var. **Maximowiczii** (*A. heterophylla, Vitis heterophylla* and var. *humulifolia*), lvs. deeply 3–5-lobed.

cordata (*A.* and *Vitis indivisa*). Lvs. broad-ovate, to 5 in. long, toothed and only slightly 3-lobed: fr. blue. Va. to Fla. and Mex.

Delavayana. Lvs. cordate-ovate, to 5 in. long, 3-lobed or -parted or sometimes simple, crenate-toothed, usually pubescent beneath: fr. dark blue. China.

dissecta: *A. aconitifolia.*

Engelmannii: *Parthenocissus quinquefolia* var.

flexuosa: *A. brevipedunculata*, at least in part.

hederacea: *Parthenocissus quinquefolia.*

Henryana: *Parthenocissus Henryana.*

heptaphylla: *Parthenocissus heptaphylla.*

heterophylla: *A. brevipedunculata* var. *Maximowiczii.*

hirsuta: *Parthenocissus quinquefolia* var.

humulifolia (*Vitis humulifolia*). Lvs. broad-ovate, to 5 in. long, 3–5-lobed, coarsely toothed, shining above, whitish beneath: fr. pale yellow or pale blue. China.

hypoglauca: *Cissus hypoglauca.*

indivisa: *A. cordata.*

japonica. Root tuberous: lvs. of 3–5 pinnate or pinnately lobed lfts. to 4 in. long, shining above, the rachis broadly winged: fr. blue. Japan, China.—Some of the material cult. under this name belongs to *Parthenocissus tricuspidata.*

Lowii: *Parthenocissus tricuspidata* var.

megalophylla. Lvs. pinnate or bipinnate, lfts. ovate, to 5 in. long, coarsely toothed: fr. black. China.

micans. Lvs. ovate, to 4 in. long, unlobed or shallowly lobed, coarsely toothed, pale beneath: fr. dark blue. China.

orientalis (*Vitis orientalis*). Lvs. pinnate or bipinnate, lfts. to 3 in. long, sharply notched: fr. red. S. W. Asia.

quinquefolia: *Parthenocissus quinquefolia.*

Saint-Paulii: *Parthenocissus quinquefolia* var.

Thomsoni: *Parthenocissus Thomsoni.*

tricuspidata: *Parthenocissus tricuspidata.*

variegata: *A. brevipedunculata* var. *elegans.*

Veitchii: *Parthenocissus tricuspidata* var.

vitacea: *Parthenocissus quinquefolia* var.

Watsoniana. Lvs. pinnate, lfts. oblong, to 4½ in. long, slightly toothed, purplish beneath. China.

AMPHICOME. *Bignoniaceæ.* Himalayan per. herbs, sometimes woody at base, with alternate pinnate lvs. and funnelform red fls. in terminal racemes; one species is grown in rock-gardens and greenhouses.

arguta. To 3 ft.: lfts. 5–9, lanceolate, to 1½ in. long, deeply toothed: fls. 1 in. long, narrowed at base, in racemes to 8 in. long.

AMPHILOPHIS: *Andropogon saccharoides.*

AMSONIA. *Apocynaceæ.* Per. herbs with alternate lvs., terminal panicles of narrow blue fls., included stamens, and long slender frs.; native in N. Amer. and E. Asia.

The amsonias are grown in shady positions in the hardy border for ornament. Propagated by division, seeds or cuttings.

salicifolia: *A. Tabernæmontana* var.

Tabernæmontana. To 3½ ft.: lvs. ovate to lanceolate, to 4 in. long: fls. ¾ in. long, pubescent outside, in a dense cluster, May–July. N. J. to Fla. and Tex., in low grounds. Var. **salicifolia** (*A. salicifolia*) has narrower lvs., and fls. few in a loose cluster.

texana. To 2½ ft.: lvs. ovate to oblong, and to linear above, to 2½ in. long: corolla-tube to ½ in. long, glabrous outside, Apr.–July. Okla., Tex.—Probably a var. of *A. ciliata* (*A. angustifolia*), more eastward, with rather smaller fls. and narrower lvs.

AMYGDALUS: *Prunus.*

ANACAMPSEROS. *Portulacaceæ.* S. African succulent herbs with fleshy lvs. and racemose fls. opening only in the sun, with 2 sepals and 5 fugacious petals; occasionally grown in the greenhouse. Propagated by seeds or by stem- and leaf-cuttings.

arachnoides. Lvs. ovate, ¼ in. long, cobwebbed, green and shining: fls. white, in 2–3-fld. racemes on scapes to 4 in. high. Var. **grandiflora** (*A. rufescens*) has purplish lvs. and fls.

rufescens: *A. arachnoides* var. *grandiflora.*

Telephiastrum. Lvs. ovate, ⅛ in. long, glabrous: fls. reddish, in 2–4-fld. racemes on scapes to 6 in. high.

ANACARDIACEÆ. CASHEW FAMILY. About 60 genera of woody plants with resinous bark, mostly in the tropics but some of them extending into cool temp. regions, sometimes evergreen; some species have medicinal, tanning and poisonous properties and yield material for varnishes, others are grown for their edible fruit, and still others for ornament. The family is characterized by alternate lvs., the small bisexual or unisexual fls. with a disk between the stamens, 1–6-celled ovary with 1 seed in each cell and 1–6 styles, and fr. commonly a drupe or nut. The following genera are sometimes cult. in our territory: Anacardium, Cotinus, Harpephyllum, Lithræa, Mangifera, Pistacia, Pleiogynium, Rhus, Schinus, Spondias.

ANACARDIUM. *Anacardiaceæ.* Trees and shrubs of trop. Amer., one cult. for its nuts, with simple leathery lvs., numerous small polygamous fls. in terminal panicles, 7–10 stamens, and kidney-shaped fr. borne on a greatly enlarged soft receptacle. Of simple cult. in regions free from frost. Propagated by seeds or choice varieties by shield-budding.

occidentale. CASHEW. Evergreen spreading tree to 40 ft.: lvs. to 8 in. long and 4 in. wide: fls. yellowish-pink: fr. consisting of fleshy bright yellow or red receptacle (cashew-apple, from which sweetmeats and beverages are made) 2–3½ in. long, and kidney-shaped nut containing kernel edible when roasted. Trop. Amer.; nat. in all trop. countries; planted also in S. Fla.

ANACHARIS: *Elodea canadensis.*

ANACYCLUS. *Compositæ.* Ann. or per. herbs, somewhat like the chrysanthemums and chamomiles, with pinnately cut lvs. and many-fld. solitary heads of yellow disk-fls. and white, yellow or purplish ray-fls.; pappus none or consisting of a crown or scales; native in Medit. region and Orient. Sometimes grown in the flower-garden.

officinarum. Ann. to 10 in.: lvs. 2-pinnatisect into linear segms.: ray-fls. white marked purple beneath, heads 1 in. across. S. Eu.

Pyrethrum. Per., procumbent: lvs. 2-pinnatisect into linear segms: ray-fls. white, purplish beneath. S. E. Eu.

radiatus. To 1 ft.: lvs. 2-pinnatisect into linear segms.: ray-fls. yellow, heads 1 in. across. Medit. region..

ANAGALLIS. Pimpernel. *Primulaceæ.* Widely distributed herbs having usually opposite or whorled lvs., axillary solitary fls. in shades of red, blue and white, wheel- or bell-shaped corolla, usually hairy stamens, and fr. opening transversely.

Seeds of the annual species may be sown where the plants are to be grown. The perennials are propagated by division and cuttings.

arvensis. Poor Mans Weatherglass. Spreading ann.: lvs. ovate, to ¾ in. long: fls. scarlet or white, about ¼ in. across. Nat. from Eu. and Asia. Var. **cærulea** has blue fls. Var. **phœnicea** has red fls.

grandiflora: *A. linifolia.*

linifolia (*A. grandiflora. A. Phillipsii*). Per. or bien. to 1½ ft.: lvs. linear or linear-lanceolate, to 1 in. long: fls. blue, reddish beneath, ¾ in. across. Medit. region. Var. **collina**, fls. rose or purplish. Var. **Monelli**, lvs. ovate or oblong.

Phillipsii: *A. linifolia.*

ANANAS. *Bromeliaceæ.* One stiff terrestrial per. herb native in trop. Amer., grown for the edible fr.-head. **A. sativus** (*A. comosus*). Pineapple. St. to 4 ft.: lvs. in rosettes, to 3 ft. long and 1½ in. wide, with spiny tips and prickly edges: fls. bisexual, violet or reddish, borne in dense heads crowned with a tuft of lvs.: fr. fleshy and watery, being really a thickened st. in which the berries are imbedded, becoming 1 ft. long. A few forms are cult. for ornament, as var. **variegatus** with striped lvs. and **A. Porteanus** with olive-green lvs. having a central yellow band. For cult., see *Bromelia* and *Pineapple.*

ANAPHALIS. *Compositæ.* White-woolly perennials with leafy sts., interesting for the rock-garden and hardy border, the small white or gray corymbose heads remaining stiff and dry; fls. all tubular; pappus bristly. They are often cut before maturity, dried and dyed for use as everlastings.

margaritacea (*Antennaria margaritacea*). Pearl Everlasting. To 3 ft.: lvs. linear-lanceolate, to 5 in. long, entire, green above, white-tomentose beneath: heads white, ¼ in. across. N. Amer., Eu., N. Asia.

ANASTATICA. *Cruciferæ.* One little ann., **A. hierochuntica,** is sometimes grown for curiosity as Resurrection-Plant or Rose-of-Jericho. When ripe and dead the branches curve inward forming a ball-like object that rolls over the deserts and which opens out when moist. The seeds are borne in small hairy pods or silicles close along the branches and soon germinate when wet weather comes. The balls are sometimes sold; they open and close with moisture and dryness. It is a gray unattractive plant a few inches high, with oblong-spatulate toothed lvs. and minute white fls. The plant is easy to grow in warm locations. Algeria to Arabia and Persia.

ANASTROPHUS: *Axonopus compressus.*

ANATHERUM. *Gramineæ.* Per. grasses with aromatic roots from which perfumery and medicines are made, narrow lvs. and spikelets borne in narrow terminal panicles. See *Grasses.*

zizanioides (*Vetiveria zizanioides*). Vetiver-Khus-Khus. To 8 ft.: lvs. to 3 ft. long and ⅓ in. wide, rough on edges: panicles to 1 ft. long, the branches ascending. Asia, E. Indies; escaped in La.—Sometimes planted far S. along divisions between areas.

ANAY: *Hufelandia.*

ANCHISTEA: *Woodwardia virginica.*

ANCHOR-PLANT: *Colletia cruciata.*

ANCHUSA. Alkanet. Bugloss. *Boraginaceæ.* Old World hairy herbs with alternate simple lvs. and blue, violet or white funnelform or tubular fls. in coiled leafy-bracted cymes or racemes; throat of corolla bearing scales. Of easy cult. in the flower-garden or border. Propagated by seeds in spring or division of the roots.

angustifolia: *A. officinalis* var.

azurea (*A. italica*). Per. to 5 ft.: lvs. lanceolate to ovate-lanceolate: fls. bright blue, to ¾ in. across, in summer and autumn; calyx-lobes long-pointed. Medit. region.—Known in several hort. forms, as Dropmore, Opal, Perrys, Picotee, Pride of Dover.

Barrelieri. Per. to 2 ft.: lvs. ovate-lanceolate: fls. blue with white tube and yellow throat, in spring. Eu., Asia Minor.

capensis. Bien. to 1½ ft.: lvs. narrowly lanceolate: fls. blue margined with red and with white throat, ¼ in. across, in summer and autumn. S. Afr. Var. **alba** has white fls.

italica: *A. azurea.*

myosotidiflora: *Brunnera macrophylla.*

officinalis. Bien. or per. to 2 ft.: lvs. lanceolate: fls. bright blue or purple, ¼ in. across, in summer and autumn. Eu. Var. **incarnata** has flesh-colored fls. Var. **angustifolia** has narrowly lanceolate lvs.

sempervirens: *Pentaglottis sempervirens.*

ANDIRA. Angelin-Tree. *Leguminosæ.* Trees mostly native in trop. Amer., with alternate pinnate lvs., fragrant papilionaceous fls. in terminal panicles, and drupe-like pods. They require trop. temperature and rich loamy soil. Propagated by cuttings over bottom heat, when seeds are not available.

inermis (*Vouacapoua americana*). Cabbage-Tree. To 40 ft. or more: lfts. to 2½ in. long: fls. lilac or pale rose: pods 1½ in. long. Trop. Amer., W. Afr.

ANDROMEDA. Bog-Rosemary. *Ericaceæ.* Low evergreen shrubs, now restricted to 2 species, with narrow entire revolute lvs., pinkish urn-shaped fls. in nodding terminal umbels, and capsular frs.

Grown in rockeries and borders and very hardy North. Propagated by seeds, cuttings of mature wood under glass, and by layers.

arborea: *Oxydendrum arboreum.*

cærulea: *Phyllodoce cærulea.*

calyculata: *Chamædaphne calyculata.*

cassinifolia: *Zenobia pulverulenta* var. *nuda.*

Catesbæi: *Leucothoë Catesbæi.*

floribunda: *Pieris floribunda.*

glaucophylla. Similar to *A. polifolia* but the lvs. white-tomentose beneath and fr. glaucous. Newf. to N. J. and Ind.

japonica: *Pieris japonica.*

ligustrina: *Lyonia ligustrina.*

mariana: *Lyonia mariana.*

polifolia. To 1 ft., the rootstocks creeping: lvs. oblong to linear, to 1½ in. long, the margins revolute, glaucous beneath: fls. ¼ in. long. Eu., N. Asia, N. N. Amer.

pulverulenta: *Zenobia pulverulenta*

speciosa: *Zenobia pulverulenta.*

ANDROPOGON. Beard-Grass. *Gramineæ.* Per. grasses widely distributed in both hemispheres, having narrow lvs. and spikelets in spike-like racemes which are borne singly, in pairs or clusters, florets awned, rachis prominently bearded; a few grown for forage. See *Grasses.*

argenteus: *A. saccharoides;* see also *A. hirtus.*

furcatus. To 6 ft., branched above: lvs. to 1½ ft. long and ½ in. wide: racemes to 5 in. long, 2–6 at tips of sts., florets awned. Me. to Fla. and N. Mex.

halepensis: *Holcus halepensis.*

hirtus. To 3 ft.: lvs. to 1 ft. long and 1/12 in. wide, slightly glaucous with white midrib: racemes to 1½ in. long, silvery-hairy, in pairs in loose panicles to 1 ft. long. Warm regions of Old World.—Some of the material cult. as *A. argenteus* belongs here.

saccharoides (*A. argenteus. Amphilophis saccharoides*). To 3½ ft.: lvs. to 8 in. long and ⅓ in. wide: racemes 1½ in. long, silky-hairy, in shining white panicles to 4 in. long. Colo. to Mex., W. Indies, N. S. Amer.

Sorghum: *Holcus Sorghum.*

ANDROSACE. Rock-Jasmine. *Primulaceæ.* Small tufted herbs of Eu., Asia and N. Amer., sometimes grown in rock-gardens or low borders: lvs. mostly basal: fls. in shades of red and white, resembling primroses but the corolla shorter than the calyx and constricted at the throat.

Androsaces require well-drained soil which must not be allowed to dry out in time of drought. Propagated by seeds, division or cuttings.

alpina (*A. glacialis*). Per. to 3 in., loosely tufted: lvs. in rosettes at ends of branches, oblong-lanceolate, ⅕ in. long, hairy: fls. rose, solitary, ⅕ in. across. Alps.

arachnoidea: *A. villosa* var.

brigantiaca: *A. carnea* var.

carnea. Per. to 3 in.: lvs. linear, to ¾ in. long, forming rosettes: fls. in 3–7-fld. umbels, rose or whitish with a yellow eye, ⅓ in. across. Alps and Pyrenees. Var. **brigantiaca** has narrower lvs. and white fls. Var. **Halleri** (*A. Halleri*) has longer shining hairy lvs. Var. **Laggeri** (*A. Laggeri*) is more densely tufted and with short scape.

Chamæjasme. Per. to 3 in.: lvs. lanceolate to ovate, to ½ in. long, hairy, forming rosettes: fls. in umbels, white with yellowish eye, to ½ in. across. N. Asia, Eu., N. N. Amer.

Chumbyi, chumbyiense: *A. sarmentosa* var.

ciliata. Per. to 3 in.: lvs. oblong-ovate, ¼ in. long, ciliate on margins, forming rosettes: fls. rose, ⅓ in. across, solitary. Pyrenees.

coronopifolia: *A. lactiflora.*

foliosa. Per. to 5 in., stoloniferous: lvs. all basal but not in rosettes, obovate, to 1½ in. long: fls. pink, in umbels. Himalayas.

glacialis: *A. alpina.*

Halleri: *A. carnea* var.

hedreantha. Per. to ½ in.: lvs. oblong-lanceolate, ⅓ in. long, in rosettes: fls. violet-red, in 5–10-fld. umbels. Balkans.

helvetica. Per., densely tufted: lvs. lanceolate, very small, in dense rosettes, hairy: fls. white, ⅙ in. across, solitary, nearly sessile. Alps.

lactea. Per. to 8 in.: lvs. linear or linear-lanceolate, to ¾ in. long: fls. snow-white, ⅓ in. across, in umbels, the pedicels to 2 in. long. Mts. of Eu.

lactiflora (*A. coronopifolia*). Ann. to 1 ft.: lvs. linear-lanceolate, to 2 in. long, forming rosettes: fls. in large clusters, white, to ½ in. across. Siberia.

Laggeri: *A. carnea* var.

lanuginosa. Per. covered with silky white hairs, prostrate: lvs. both basal and st., lanceolate-ovate, to ¾ in. long: fls. in dense clusters on scapes about 2 in. long, rose-colored, ⅓ in. across. Himalayas.

obtusifolia. Per. to 6 in.: lvs. lanceolate, to ¾ in. long, in rosettes: fls. white or pinkish, ⅓ in. across, in umbels. Alps.

primuloides. Stoloniferous, the runners to 4 in. long: lvs. linear-lanceolate, to ½ in. long or the larger ones 2 in. or more, in rosettes, covered with silvery hairs: fls. in clusters on scapes to 5 in. high, pink, to ½ in. across. Himalayas.

puberulenta. Ann. to 8 in.: lvs. oblanceolate, to 1¼ in. long, pubescent, in rosettes: fls. white, ⅙ in. across, in umbels, the pedicels to 2 in. long. Alaska to New Mex.

sarmentosa. Stoloniferous, the runners to 5 in. long: lvs. lanceolate or ovate-lanceolate, to 1½ in. long, in rosettes, covered with silvery hairs when young: fls. many, in clusters on scapes to 5 in. high, rose-colored, ¼ in. across. Himalayas. Var. **Chumbyi** (*A. Chumbyi* and *chumbyiense*). More cespitose and woolly. Var. **Walkinei** is listed.

sempervivoides. Stoloniferous, the runners to 2 in. long: lvs. ovate, to ¼ in. long, fleshy, in rosettes on the stolons: fls. rose, ¼ in. across, in umbels on scapes to 4 in. high. Himalayas.

septentrionalis. Ann. to 8 in.: lvs. lanceolate or oblong, to ¾ in. long, in rosettes: fls. white or pink, to ⅕ in. across, in umbels. Eu., Asia, N. N. Amer.

spinosissima: listed name.

villosa. Per. to 3 in., densely white-hairy: lvs. lanceolate, in rosettes: fls. white or rose with yellowish-red throat, ⅓ in. across, in umbels. Eu., Asia. Var. **arachnoidea** (*A. arachnoidea*), lvs. oblong-ovate, to 1 in. high.

Vitaliana: *Douglasia Vitaliana.*

ANDROSTEPHIUM. *Liliaceæ.* Cormous American herbs with basal linear lvs. and blue fls. in terminal umbels, the perianth-segms. united about half way; one species is sometimes planted in the wild-garden or border.

cæruleum (*A. violaceum*). To 8 in.: fls. lilac or violet, 1 in. long. Kans. to Tex.

violaceum: *A. cæruleum.*

ANEMONE. Anemone or Anemony. Windflower. *Ranunculaceæ.* Attractive perennials, blooming in spring, summer or autumn, white, rose, red or even purplish; the lvs. are more or less divided or dissected or even compound; fr. an achene which in the Pulsatilla section has long feathery styles; mostly native in the north temp. zone. As a Latin generic name the word is pronounced Anemo′-ne; as an English vernacular, Anem′-one.

Anemones are valuable in all types of gardens, where they thrive in rich sandy loam, many in partial shade. Aside from the florists' and Japanese anemones, the species are employed mostly in wild borders and for colonizing. The florists' tuberous-rooted kinds, as St. Brigid and The Bride, are useful for late winter and spring bloom in the house, being started in autumn in flats and handled after the manner of freesias. These and similar anemones may also be flowered out-of-doors, with the culture of tulips and hyacinths, if given good winter protection as they will not stand much frost. These florists' plants are of the species *A. coronaria, A. fulgens, A hortensis.*

The Japanese anemones are amongst the best perennial herbs for autumn bloom. They stand for some years in good land; the situation should be protected from strong wind.

Most species can be propagated by seed or by root-division, the best time for the latter being in early spring; sow the seed in the fall as soon as it has ripened.

acutipetala: *A. alpina.*

Allenii: *A. apennina* var., *A. nemorosa* var.

alpina (*A. acutipetala. Pulsatilla alpina*). To 1½ ft.: involucral lvs. short-petioled: fls. few in a cluster or solitary, cream inside, purple outside, to 3 in. across, May–June. Eu. Var. **sulphurea** is soft sulfur-yellow.

angulosa: *Hepatica angulosa.*

apennina. To 9 in., with tuberous roots: involucral lvs. long-petioled: fls. solitary, sky-blue, 1½ in. across, Mar.–Apr. Woods, Italy. Var. **Allenii**, fls. pale blue; var. **plena**, fls. double; var. **purpurea**, fls. mauve.

baldensis. To 6 in.: involucral lvs. petioled: fls. solitary, white, often tinged rose outside, to 2 in. across, July–Aug. Rocky places in the high Alps.—*A. Drummondii* of the Rocky Mts. and Calif. is considered to belong here.

blanda. To 6 in., with tuberous root: fls. deep sky-blue, larger than in *A. apennina*. Greece, Asia Minor.

borealis: a synonym of *A. parviflora*.

cærulea: *A. nemorosa* var. *Robinsoniana*.

canadensis (*A. pennsylvanica. A. dichotoma*). Meadow A. To 2 ft.: involucral lvs. sessile: fls. solitary, white, to 2 in. across, May–Aug. On shores, in low places and open meadows, N. Amer.

caroliniana (*A. decapetala*). To 1 ft., with tuberous root: involucral lvs. sessile: fls. solitary, cream or purple, to 1½ in. across, Apr.–May. Open places, Ill. to Fla. and Tex.

coronaria. Poppy-flowered A. Poppy A. To 1½ ft., root tuberous: involucral lvs. sessile, finely divided: fls. solitary, poppy-like, of many shades and combinations of red, blue, white, to 2½ in. across, early spring–June. Meadows, Medit. region.—The most common anemone of the florists for forcing. In the trade are The Bride, St. Brigid, semi-double many colors, Victoria Giant. Var. **flore-pleno** has double fls. in many colors, and var. **chrysanthemiflora** very double fls.

cylindrica. Candle A. To 2 ft.: involucral lvs. long-petioled: fls. in clusters, greenish-white, ¾ in. across, June–Aug.: fr. long and narrow. Open places, N. Amer.

decapetala: *A. caroliniana*.

deltoidea. To 1 ft.: involucral lvs. sessile, 3-parted: fls. solitary, white, about 2 in. across. Wash. to Calif.

dichotoma: *A. canadensis*.

Drummondii: see *A. baldensis*.

fulgens. Flame A. Scarlet A. To 1 ft., the root tuberous: involucral lvs. sessile, entire or slightly cut: fls. solitary, scarlet, the stamens black, to 2½ in. across, May–June. France.

globosa (*A. multifida*). To 20 in.: involucral lvs. short-petioled: fls. red to whitish or yellowish, about 1 in. across, May–Sept. Meadows and hillsides, W. N. Amer.

Halleri (*Pulsatilla Halleri*). To 6 in., covered with silky white hairs: involucral lvs. sessile: fls. lilac, 2½ in. across, June. Sunny places, Switzerland.

Hepatica: *Hepatica americana* and *nobilis*.

hortensis. Garden A. Broad-leaved A. To 10 in., the root tuberous: involucral lvs. sessile, entire or only slightly divided: fls. red, rose, purple or white with brownish-violet stamens, to 3 in. across, May. S. Eu.

hupehensis: reported as a dwarf early-flowering form of *A. japonica* with pink or pale mauve fls. shaded with deeper pink on back.

hybrida: name of indefinite and various application.

japonica. Japanese A. Stout, branching, to 3 ft.: lvs. of 3 ovate toothed or lobed lfts.: peduncles several: fls. purplish, red, rose, white, to 3 in. across, Sept. to late frosts. Japan, China. Var. **alba**, fls. white; var. **crispa**, lvs. crisped on edges; var. **rosea superba**, fls. rose; var. **rubra**, fls. red, waxy. Some of the vernacular-named forms are: Alice, rosy-carmine; Coupe d'Argent, white; Frau Marie Manshart, Herbstrose, double, rose; Honorine Joubert, white; Kriemhilde, lilac; Lady Ardilaun, white; Loreley, silver pink; Louise Uhink, white; Magdalena Uhink, double; Max Vogel, deep rose, semi-double; Mount Rose, double, deep pink; Prince Henry, dark red; Profusion, semi-double, rose; Queen Charlotte, semi-double, pink; Richard Ahrens; Whirlwind, semi-double, white.

magellanica. Trade name, applied sometimes to a yellow-fld. plant, and sometimes to a white-fld. subject with deeply cut foliage.

montana (*Pulsatilla montana*). Similar to *A. Halleri* but with glabrous lvs. and dark violet drooping fls. Eu., Caucasus. Vars. **alba** and **rubra** are color forms.

multifida: *A. globosa*. The true *A. multifida* of botanists, native in S. S. Amer., is probably not in cult.

narcissiflora. To 1½ ft.: involucral lvs. sessile: fls. several in a cluster, white, to 1 in. across, May–July. Mts. of Eu.—The American representative has been separated as *A. zephyra* which is distinguished by its lemon-yellow usually solitary fls. and lvs. less lobed.

nemorosa. European Wood A. To 8 in.: involucral lvs. petioled: fls. white or purplish, solitary, 1 in. across, Apr.–May. Eu., Siberia. Hort. vars. are: **alba** (var. *flore-pleno*), pure white; **Allenii**, lavender-mauve; **major**, white; **Robinsoniana** (var. *cærulea*), blue, Mar.–Apr.: **rosea** (var. *rubra fl. pl.*), reddish-purple.

Nuttalliana: *A. patens* var.

occidentalis (*Pulsatilla occidentalis*). To 1½ ft.: involucral lvs. sessile: fls. solitary, white or purplish, to 2 in. across, May. B. C. to Calif.

palmata. To 9 in., the root tuberous: lvs. nearly orbicular, not divided, involucral lvs. sessile: fls. golden-yellow, solitary or in 2's, about 1 in. across, May–June. Medit. region. Var. **albida** (var. *alba*), fls. white; var. **flore-pleno**, fls. double; var. **lutea**, fls. yellow.

parviflora. To 1 ft.: involucral lvs. nearly sessile: fls. white or tinged with rose, to 1 in. across, May–June. N. Asia, N. N. Amer.

patens (*Pulsatilla patens*). Per. to 3–6 in. high when in bloom but becoming 1 ft. and more in fr.: lvs. basal, appearing after the bloom, ternate (petiole not running through the blade), divided into many linear lobes, the involucre of sessile divided bracts: fls. purplish, rarely white, to 2½ in. across. Eu., N. Asia; native Ill. to B. C. and Alaska in races sometimes separated as var. *Nuttalliana* (or var. *Wolfgangiana*), and *Pulsatilla hirsutissima* and *P. ludoviciana*.

pennsylvanica: *A. canadensis*.

pratensis. One of the Pulsatilla group from N. Eu.: to 12 in.: lvs. pinnately parted into linear segms.: fls. dark purple, hanging, with 6 reflexed sepals.

Pulsatilla (*Pulsatilla vulgaris*). Pasque Flower. To 1 ft.: lvs. pinnately dissected (along a rachis), appearing with the fls.: involucral lvs. sessile, silky-hairy: fls. solitary, blue to reddish-purple, bell-shaped, to 2½ in. across, Apr. Eu. Color vars. are **lilacina, rubra, variegata.**

quinquefolia (*A. nemorosa* var. *quinquefolia*). American Wood A. Differs from *A. nemorosa* in the slender sts., less lobed involucral lvs. and smaller fls. E. N. Amer.

ranunculoides. Yellow Wood A. To 8 in., the rootstock somewhat tuberous: involucral lvs. nearly sessile: fls. usually solitary, golden-yellow, to 1 in. across, Apr.–May. Eu., Siberia. Var. **flore-pleno** has partially double fls.

rivularis. To 3 ft., branched: fls. white or tinged blue outside, 1½ in. across, in many-fld. cymes. India, Ceylon.

Robinsoniana: *A. nemorosa* var.

rupicola. To 1 ft., silky: lvs. 3-parted, the segms. toothed or cut, the radical ones long-stalked: fls. 1 or 2, large and showy, white, often pinkish outside. Himalayas.

sibirica. To 6 in.: involucral lvs. short-stalked: fls. solitary, white. Siberia.

sulphurea: *A. alpina* var.

sylvestris. Snowdrop A. To 1½ ft.: involucral lvs. long-petioled: fls. solitary or in 2's, pure white, fragrant, to 1½ in. across, often nodding, May–June. Eu., S. W. Asia. Var. **flore-pleno** has double fls.

thalictroides is *Anemonella thalictroides*.

vernalis (*Pulsatilla vernalis*). To 6 in.: involucral lvs. pinnate, silky-hairy: fls. purple outside, white inside, Apr. Eu.

virginiana. To 3 ft., branching above: involucral lvs. long-petioled: peduncles 2–5; fls. white or greenish, to 1½ in. across, June–Aug. Woods, N. S. to S. C. and Kans.

vitifolia. Grape-leaf A. Vine-leaved A. To 3 ft., branched: lvs. deeply 5-lobed, densely tomentose beneath; involucral lvs. petioled: fls. white, to 2 in. across, in many-fld. cymes, July. Himalayas.

zephyra: see *A. narcissiflora*.

ANEMONE, RUE-: *Anemonella thalictroides*.

ANEMONELLA (*Syndesmon*). *Ranunculaceæ*. One delicate per. herb with tuberous roots, native in E. N. Amer., sometimes transferred to the wild-garden or colonized. **A. thalictroides** (*Thalictrum anemonoides*). Rue-Anemone. To 9 in.: lvs. ternately compound, those of the involucre sessile: fls. white or pink, to 1 in. across, in terminal umbels, Mar.–June. Var. **flore-pleno** has double fls. —It thrives in partial shade in light moist soil. Propagated by division of roots in spring or autumn.

ANEMONOPSIS. *Ranunculaceæ.* One Japanese per. herb to 3 ft., grown as a border plant. **A. macrophylla.** Lvs. ternately compound and cut: fls. pale purple, drooping, 1½ in. across, with many petals and petal-like sepals, borne in loose racemes.—Does best in rich soil in partially shady well-drained situations. Propagated by division of roots in spring or autumn or by seeds sown in sandy loam.

ANEMONY: *Anemone.*

ANEMOPÆGMA. *Bignoniaceæ.* Mostly Brazilian climbing shrubs with lvs. of 2–3 entire lfts., funnelform fls. in lateral racemes, and fr. a woody or leathery caps.; grown under glass or in the open in warm regions.

Chamberlaynii (*A. racemosum. Bignonia Chamberlaynii*). Lvs. of 2 oblong or ovate lfts. to 7 in. long and a terminal tendril: fls. pale yellow striped in throat with purple or white, to 3 in. long, in racemes longer than lvs.: fr. oval, to 6 in. long.—*Doxantha Unguis-cati* is sometimes grown under this name.

racemosum: *A. Chamberlaynii.*

ANEMOPSIS. *Saururaceæ.* One per. aquatic herb with aromatic rootstocks having medicinal properties. **A. californica.** Yerba Mansa. To 1½ ft., the st. with 1 broad clasping lf. bearing 1–3 small lvs. in axil: lvs. mostly basal, elliptic-oblong, to 6 in. long: fls. very small, in a dense spike to 1½ in. long which is subtended by white petal-like involucral bracts. Calif., Ariz., Mex.

ANETHUM. *Umbelliferæ.* Ann. or bien. herbs native in the Old World, with lvs. 3–4-pinnately divided into linear segms., small yellow fls. in umbels, and flattened frs.; one species grown for the seeds which are used for flavoring. Easily grown from seeds which should be sown in a warm open situation.

graveolens. Dill. To 3 ft.: lvs. very finely cut into thread-like divisions. Eu.; nat. in N. Amer.

ANGELICA. *Umbelliferæ.* Per. herbs with compound lvs., small white or greenish fls. in terminal umbels, and compressed frs.; sometimes planted in borders for bold effects. Propagated by seeds and sometimes by division.

Archangelica (*Archangelica officinalis*). Stout bien. or per., to 6 ft.: lvs. 2-pinnate into 3-parted lfts. Eu., Asia, in low ground.

Curtisii. To 4 ft.: lvs. biternate, the divisions pinnate: umbels to 6 in. across. Pa. to Ga., in woods.

rosæfolia. Sts. to 5 ft. long, scrambling: lvs. of 2–5 pairs of toothed lfts. to 2½ in. long: umbels to 3 in. across. New Zeal.

ANGELICA, JAPANESE: *Aralia elata.*

ANGELIN-TREE: *Andira.*

ANGELONIA. *Scrophulariaceæ.* Per. herbs and subshrubs with opposite lvs. or the upper alternate and showy 2-lipped tubular blue fls. solitary and axillary or in terminal racemes; native in trop. Amer. Grown readily in greenhouses in the N. and in the open far S. Propagated by seeds or softwood cuttings.

angustifolia. Per. to 1 ft., glabrous: lvs. narrow-lanceolate, toothed: fls. violet or purple, in long racemes. Mex., Cuba.

grandiflora: probably a hort. form of *A. salicariæfolia.*

salicariæfolia. Per. to 2 ft., sticky-pubescent: lvs. lanceolate to linear-oblong, to 3 in. long, toothed: fls. blue, to ¾ in. across, in leafy racemes. N. S. Amer.

ANGELS-TRUMPET: *Datura arborea.*

ANGIOPTERIS. *Marattiaceæ.* Large ferns with short thick sts. and bipinnate lvs. with sori in a marginal row; native in the southern hemisphere and grown sometimes in greenhouse collections. For cult. see *Ferns.*

evecta. St. or caudex 2 ft. thick and 2–6 ft. high: lfts. to 1 ft. long, entire or toothed. Japan to Australia and Madagascar.

pruinosa. Probably a pruinose-nigrescent form of *A. evecta.* Java.

ANGOPHORA. Gum-Myrtle. *Myrtaceæ.* E. Australian trees or shrubs told from Eucalyptus by opposite lvs.; fls. white, in terminal corymbs; frs. capsular. Rarely planted in S. U. S.

lanceolata. Large tree with smooth deciduous bark: lvs. lanceolate, to 5 in. long.

ANGRÆCUM. *Orchidaceæ.* Epiphytes with very thick lvs. and fls. usually in racemes, the sepals and petals similar, the lip with side lobes small or lacking, entire middle lobe and long slender spur; grown in the hothouse. For cult. see *Orchids.*

distichum: *Mystacidium distichum.*

eburneum. Sts. to 4 ft. high: lvs. to 2 ft. long and 2 in. wide: fls. to 4 in. across, the sepals and petals greenish-white, the lip ivory-white with green spur about 3 in. long, in 8–15-fld. racemes longer than lvs., Oct.–Nov. Madagascar.

Eichlerianum. Sts. pendulous, to 3 ft. long: lvs. to 5 in. long and 2 in. wide: fls. about 3 in. across, solitary or 2 together on stalks about length of lvs., the sepals and petals yellow-green, the lip white, greenish-yellow at base, with spur about 2 in. long, June–Sept. Trop. Afr.

Leonis. Nearly stemless: lvs. to 8 in. long, lanceolate: fls. to 3 in. across, the sepals and petals yellowish, the lip white with spur to 6 in. long, in 3–5-fld. racemes, Jan.–Apr. Comoro Isls.

modestum: *Aerangis modesta.*

Sanderianum: *Aerangis modesta.*

Scottianum. Sts. pendulous, to 1 ft. long: lvs. to 4 in. long and cylindrical: fls. to 2½ in. across, white with yellow spur to 4 in. long, borne singly or 2 together on stalks about 1½ in. long, July–Aug. Comoro Isls.

sesquipedale (*Macroplectrum sesquipedale*). Sts. to 3 ft. high: lvs. to 1 ft. long and 2 in. wide: fls. 5 in. or more across, ivory-white, the spur to 1 ft. long, in 2–4-fld. racemes about length of lvs., Dec.–Feb. Madagascar.

ANGULOA. *Orchidaceæ.* Terrestrial orchids from the Andes of Colombia with pseudobulbs bearing 2–3 plaited lvs. and fls. solitary on erect scapes, the fleshy sepals and petals united and almost concealing the smaller 3-lobed lip; grown in a cool greenhouse. See *Orchids.*

Clowesii. Pseudobulbs to 6 in. long: lvs. to 2 ft. long: fls. yellow, solitary on scapes to 1 ft. long, May–June. Var. eburnea has ivory-white fls.

eburnea: *A. Clowesii* var.

Ruckeri. Somewhat smaller than *A. Clowesii* but with olive-green fls. which are brown or spotted within, on scapes to 8 in. long, May–June.

ANHALONIUM: *Ariocarpus, Lophophora, Roseocactus.*

ANIGOZANTHOS. *Amaryllidaceæ.* Odd Australian per. herbs with thick rootstocks, linear or sword-shaped basal lvs. and large red, purple, green or yellowish fls. borne in one-sided woolly racemes or spikes, the perianth-tube very long.

Grown in the greenhouse or out-of-doors in the South. It does best in a mixture of peat, loam and sand and should be well watered except in the winter rest period. Propagated by division of the roots.

Manglesii. To 3 ft., the st. covered with red wool: fls. green, red at base, 3 in. long, with very narrow tube, woolly.

ANISACANTHUS. *Acanthaceæ.* Shrubs native in Mex. and W. N. Amer., with opposite entire lvs. and red tubular 2-lipped fls. in one-sided terminal spikes; sometimes cult. in S. Calif.

Thurberi. To 5 ft.: lvs. lanceolate or oblong, to 2 in. long, pubescent: fls. to 1½ in. long. Ariz., New Mex., Mex.

Wrightii. To 4 ft., glabrous or nearly so: lvs. oblong to ovate-lanceolate, acute, to 2 in. long: fls. purplish-red, to 1½ in. long, in naked panicles. Tex.

ANISE: *Pimpinella Anisum.* **Star:** *Illicium verum.*

ANISOSTICHUS: *Bignonia capreolata.*

ANISOTOME. *Umbelliferæ.* Aromatic herbs of New Zeal., having pinnate lvs. and mostly unisexual white or red fls. in compound umbels; one species is sometimes grown in mild regions for ornament.

latifolia (*Ligusticum latifolium*). Per. to 6 ft. or more: lvs. leathery, shining, 2-pinnate: fls. red, in umbels to 3 in. across.

ANNATTO: *Bixa Orellana.*

ANNESLIA: *Calliandra.*

ANNONA. *Annonaceæ.* Mostly trop. American trees and shrubs grown for the edible frs. in warm climates: lvs. alternate, simple and entire: fls. solitary or clustered, mostly thick or fleshy and of odd dull colors: fr. a large fleshy syncarp formed by the fusion of the carpels and receptacle. For cult. see *Cherimoya.*

Cherimola. CHERIMOYA. To 25 ft., deciduous: lvs. ovate to ovate-lanceolate, to 10 in. long, velvety-pubescent beneath: fls. fragrant, yellow- or brown-tomentose outside, 1 in. long: fr. globular to conical, light green, to 5 in. long, smooth or with small tubercles. Andes of Peru and Ecuador.

diversifolia. ILAMA. To 25 ft.: lvs. elliptic to oblanceolate, to 5½ in. long: peduncles with leaf-like bracts at base: fls. maroon, 1 in. long: fr. oval or round, to 6 in. long, pale green or pink, with stout tubercles or sometimes smooth. Mex., Cent. Amer.

glabra. POND-APPLE. To 40 ft., evergreen: lvs. ovate to oblong, to 7 in. long: fls. yellowish marked with red inside, fragrant, 1 in. or more long: fr. ovoid, yellowish, to 4 in. long, smooth. Trop. Amer., W. Afr.—Grown as a stock.

muricata. SOURSOP. GUANABANA. To 20 ft., evergreen: lvs. obovate to elliptic, to 5 in. long: fls. yellow, 1 in. or more long: fr. ovoid, to 8 in. long, dark green, covered with short fleshy spines. Trop. Amer.

reticulata. CUSTARD-APPLE. BULLOCKS-HEART. To 25 ft., deciduous or half-evergreen: lvs. oblong-lanceolate to lanceolate, to 8 in. long: fls. yellowish, 1 in. long: fr. heart-shaped or oval, reddish-yellow or -brown, to 5 in. across, smooth, the carpels marked by impressed lines. Trop. Amer.

squamosa. SUGAR-APPLE. SWEETSOP. To 20 ft., deciduous: lvs. oblong-lanceolate to lanceolate, to 6 in. long: fls. greenish-yellow, to 1 in. long: fr. round, heart-shaped or conical, yellowish-green and glaucous, to 3 in. across, tuberculate and the carpels falling apart. Trop. Amer.

ANNONACEÆ. ANNONA FAMILY. Over 70 genera of trees and shrubs of wide distribution, mostly in the tropics, having simple alternate lvs., usually bisexual fls. with 3 sepals and 6 similar petals, numerous stamens, and fr. a syncarp or caps. The family yields edible frs. as well as ornamental subjects in the genera Annona, Artabotrys, Asimina, Cananga, Rollinia.

ANNUALS. An annual (abbreviated ann. in this book) is a plant that naturally completes its life within one year (Latin *annuus*, of a year's duration) from germination to seeding and death. In a horticultural sense the word frequently denotes a plant that blooms the first year from seed, whether or not it then completes its cycle and dies. Thus, the common bachelor button or cornflower (*Centaurea Cyanus*) is an annual, but four-o'clock is a perennial that blooms freely from seed the first year and is listed with annuals. Herbaceous plants that live only one year because they are killed by frost but which in mild climates or under glass may live two years or more are properly *plur-annuals*, as the tomato and many others. Other plants treated as annuals but that are carried over winter as bulbs or tubers are *pseud-annuals*, of which dahlia, potato, gladiolus are examples. In this book the term annual is employed mostly in the horticultural sense to designate plants that are grown from seeds for bloom or fruit only the same season.

Annuals are of simple cultural requirements as a rule. They lend themselves well to amateur gardening and experiment, and they possess a fascination all their own. The range of stature, habit and flower-color is very wide. Some of them are attractive vines. Mostly they can be grown with success in the northern states if sown directly in the garden when the weather becomes settled, in well-prepared "quick" soil. In warm climates many of them are grown in the cool season. Species that bloom very late, as cosmos, single dahlias, moonflowers, castor-beans, may be started indoors in pots or flats. Some kinds are classed as "hardy," which may be sown before frosts have ceased; others are "half-hardy," an intermediate indefinite class that may be sown before the full warm weather comes; others are "tender," that require the arrival of steady warmth before sowing or that are commonly started under glass. In North America these terms are now little used.

It is well to sow the seeds of annuals liberally. Many may not germinate. Even if they all come up, the combined strength of the rising plantlets will break the crust on hard soils; and in the thinning which follows, only strong and promising plants are allowed to remain. Better effects are also often obtained when the colors are in masses, especially if the flowers are thrown into the bays of heavy shrub borders. Plants continue to bloom for a longer period if they are not allowed to produce seeds. The flowers should be picked, if possible, as soon as they begin to fade. Most annuals should be in good bloom at three months from seed, and many of them at two months.

There is wide choice in the kinds of annuals. One's personal preference must be the guide. Yet there are some groups considered to be standard or general-purpose plants. They are easily grown almost anywhere, and are sure to give satisfaction. The remaining plants are mostly such as have secondary value, or are adapted to particular purposes or uses. Following are some of the groups of general-purpose annuals: Petunia, phlox, pink or dianthus, larkspur or delphinium, calliopsis or coreopsis, pot-marigold or calendula, bachelors-button or Centaurea Cyanus, clarkia, zinnia, marigold or tagetes, mignonette, collinsia, gilia, California poppy or eschscholzia, verbena, poppy, China aster, sweet pea, nemophila, portulaca, silene, candytuft or iberis, alyssum, stock or mathiola, morning-glory, nasturtium or tropeolum, scabiosa, salpiglossis, amaranthus, cockscomb.

White-flowered annuals: acroclinium, ageratum, alyssum, ammobium, antirrhinum, arctotis, argemony, aster, balsam, brachycome, browallia, candytuft, centaurea, chrysanthemum, clarkia, cosmos, delphinium, dianthus, four-o'clock, gomphrena, helichrysum, lavatera, lobelia, lupinus, malope, matricaria, nemesia, nemophila, nicotiana, nigella, petunia, phlox, poppy, portulaca, rhodanthe, scabiosa, schizanthus, verbena, zinnia.

Pink-, rose-, and red-flowered annuals: abronia, acroclinium, amaranthus, anagallis, antirrhinum, aster, balsam, cacalia, candytuft, centaurea, chrysanthemum, clarkia, cockscomb, convolvulus, coreopsis, cosmos, delphinium, dianthus, four-o'clock, gaillardia, godetia, gomphrena, gypsophila, helichrysum, lavatera, linaria, linum, lupinus, lychnis, malope, morning-glory, nasturtium, nemesia, phacelia, phlox, poppy, portulaca, rhodanthe, salpiglossis, salvia, saponaria, scabiosa, stock, sweet pea, verbena, zinnia.

Blue-, lilac-, lavender-, and purple-flowered annuals: ageratum, anagallis, anchusa, antirrhinum, aster, balsam, brachycome, browallia, campanula, candytuft, centaurea, convolvulus, cosmos, delphinium, gilia, linaria, lobelia, lupinus, nemesia, nemophila, nicotiana, nigella, nolana, petunia, phacelia, phlox, portulaca, salpiglossis, salvia, scabiosa, specularia, sweet pea, torenia, trachymene, verbena.

Yellow- and orange-flowered annuals are to be found in the following genera and groups: abronia, argemony, cacalia, calendula, California poppy, centaurea, chrysanthemum, coreopsis (calliopsis), cosmos, dimorphotheca, emilia, erysimum, evening-primrose, four-o'clock, gaillardia, helichrysum, hunnemannia, marigold, nasturtium, poppy, sanvitalia, sunflower, thelesperma, venidium, zinnia.

Annuals adapted to edgings: abronia, ageratum, alyssum, antirrhinum (dwarf), brachycome, California poppy, candytuft, collinsia, coreopsis (dwarf), dianthus, godetia, Gypsophila muralis, lobelia, marigold (dwarf), mesembryanthemum, nemophila, nigella, pansy, phlox, portulaca, sanvitalia, Saponaria ocymoides (perennial), verbena.

Annuals that continue to bloom after the first autumn frosts: Abronia umbellata, Adonis æstivalis, Adonis annua (autumnalis), Argemone grandiflora, calendulas, callirrhoë, Centaurea Cyanus, centauridium, Cheiranthus Cheiri, chrysanthemums, Convolvulus tricolor, dianthus of various kinds, Erysimum Perofskianum, Erysimum asperum (arkansanum), eschscholzias in several varieties, Gaillardia pulchella picta, Gilia achilleæfolia, Gilia capitata, Gilia laciniata, Gilia tricolor, Iberis affinis, Lavatera trimestris, Lychnis Cœli-rosa (oculata), Lychnis elegans, Lychnis Viscaria, mathiolas or stocks, Œnothera Lamarckiana, Œnothera Drummondii, Œnothera rosea, Phlox Drummondii, Salvia splendens, Salvia farinacea, Salvia Horminum, verbenas, Virginia stocks.

Annuals that are tendril- or petiole-climbers: balloon-vine, balsam-apple, balsam-pear, canary-bird-flower, cobea, eccremocarpus (grown as annual North), gourds, nasturtium, sweet pea, wild cucumber.

Annuals that are twiners: bean (scarlet runner and hyacinth bean), cardinal climber, cypress-vine, Japanese hop, moonflower, morning-glory and related plants, thunbergia.

ANODA. *Malvaceæ.* Mostly ann. herbs, or grown as such in cold regions, of warm countries, with alternate commonly lobed lvs. and purple or lilac fls. solitary in the axils; occasionally grown under glass or in the open for summer and autumn bloom. Propagated by seeds.

hastata. Lvs. arrow-shaped, the upper heart-shaped and 5-angled: fls. blue or white, about 1½ in. across. Mex. to Peru.—Differs from *A. lavateroides* in the reticulated carpels.

lavateroides. Lvs. heart-shaped to arrow-shaped, toothed or entire: fls. violet, purple or white, to 2 in. across. Tex. to Mex. and S. Amer.

triangularis. To 3 ft., much branched: lvs. triangular, toothed at base: fls. lilac, 1¾ in. across. Mex.

Wrightii. To 2 ft.: lvs. ovate or oblong-ovate, scarcely lobed: fls. yellow, ¾ in. across. New Mex.

ANŒCTOCHILUS: *Dossinia marmorata.*

ANOGRA: *Œnothera.*

ANOMATHECA: *Lapeirousia cruenta.*

ANOPTERIS. *Polypodiaceæ.* One delicate fern native in the W. Indies and sometimes seen under glass. **A. hexagona** (*Pteris heterophylla*). Lvs. tufted, of two kinds, to 2 ft. long, 2–3-pinnate, with marginal indusia. See *Ferns.*

ANOTA. *Orchidaceæ.* Epiphytic orchids with leafy sts. and fls. in racemes, the lip entire and spurred. See *Orchids* for cult.

densiflora (*Vanda densiflora. Saccolabium giganteum*). Sts. to 8 in.: lvs. to 1 ft. long and 2 in. wide: fls. 1 in. across, in many-fld. pendulous racemes to 16 in. long; sepals and petals white spotted at base with violet; lip purple, white near base, Nov. Burma.

violacea (*Vanda violacea. Saccolabium violaceum. Rhynchostylis violacea*). Similar to the above but with white sepals and petals spotted with violet and violet lip, Feb. Philippines.

ANSELLIA. *Orchidaceæ.* African epiphytic orchids of a few closely related species, of which one is sometimes grown in the hothouse. See *Orchids.* **A. africana.** Sts. short, bearing 4–7 linear lvs. to 1 ft. long: fls. yellow spotted with chocolate-brown, about 1 in. long, in many-fld. terminal panicles to 16 in. long, Mar.–June.

ANTELOPE-BRUSH: *Purshia.*

ANTENNARIA. EVERLASTING. PUSSYS-TOES. *Compositæ.* Per. white-woolly herbs with lvs. mostly basal and small clustered heads, the fls. diœcious and tubular; pappus of bristles.

Sometimes grown for the dry fl.-heads or in rock-gardens and adapted to poor soil. Propagated by seeds and division.

aprica. Soft-woolly, making patches, to 12 in. or less, with leafy stolons: lvs. mostly spatulate and obtuse, to 1 in. or more long, those on st. linear: heads about ⅓ in. across, the involucral bracts white or pink. S. D. to New Mex. and west.

canadensis. To 12 in., slender: lvs. spatulate or oblanceolate, to 1½ in. long, nearly or quite obtuse, with 1 prominent nerve: heads about ⅓ in. high, in close cluster, the involucre green. Newf. to Conn. and west.

candida: *A. dioica.*

carpathica. To 10 in., woolly: lvs. oblanceolate to linear, to 2 in. long: heads ¼ in. across, with brownish-purple involucral bracts. N. N. Amer., Eu., N. Asia.

dioica (*A. candida. A. tomentosa*). To 1 ft., stoloniferous: lvs. spatulate, to 1 in. long: heads ¼ in. across, with white or rose involucral bracts. Eu., Asia; reported as having escaped in N. Amer.

glauca: a listed name.

microphylla (*A. parvifolia* probably). Slender, to 12 in., with very short stolons: lvs. spatulate, obtuse or apiculate, ¾ in. or less long, silky both sides: heads about ¼ in. high. Sask. south and west.

margaritacea: *Anaphalis margaritacea.*

neglecta. To 12 in., the slender stolons leafy at tip: lvs. mostly oblanceolate, tapering to base, tomentose but nearly glabrous above, 1-nerved, to 1½ in. long: heads about ⅓ in. across, the involucre brownish with white tips. Me. to Va., Kans. and Wis.

neodioica. Slender, to 12 in., woolly, with many leafy stolons: lvs. broad-ovate to spatulate, only indistinctly 3-nerved, to 1 in. long, apiculate, white-tomentose underneath: heads to ⅓ in. broad, the involucre with white tips. Newf. to Va. and west.

parvifolia: see *A. microphylla.*

rhodantha. To 6 in.: lvs. spatulate to linear, to ¾ in. long: heads ½ in. long, involucral bracts tipped with red. Wash,

rosea. To 1½ ft., stoloniferous, white-tomentose: lvs. oblanceolate, to ¾ in. long: heads to ¼ in. long, with rose involucral bracts. Alaska to Calif. and Colo.

tomentosa: *A. dioica.*

ANTHEMIS. *Compositæ.* Herbs with finely cut strong-scented foliage and solitary fl.-heads, the ray-fls. yellow or white, disk-fls. yellow; pappus none or a minute crown.

A few kinds are useful in wild-gardens and the border, blooming from midsummer to frost. Propagated by seeds and division.

Aizoon: *Achillea ageratifolia* var.

altissima. Ann. to 3 ft.: lvs. 2–3-pinnatisect into lanceolate segms.: ray-fls. white, in heads to 2 in. across. S. Eu.

arabica: *Cladanthus arabicus.*

cinerea. Spreading per. to 1 ft., gray-pubescent or -tomentose: lvs. ovate, bipinnatisect into oblong obtuse segms.: heads large, with white rays longer than the disk. Balkans.

Kelwayi. Similar to *A. tinctoria* (of which it is apparently a form) but with deeper yellow fls. and foliage more finely cut.

montana. Per. to 10 in., silky-pubescent: lvs. pinnatisect into linear segms.: ray-fls. white. S. Eu.

nobilis. CHAMOMILE. Per. to 1 ft.: lvs. pinnatisect into narrow-linear segms.: ray-fls. white. Eu. Var. **grandiflora** has larger sometimes yellow fls. and **flore-pleno** double.

tinctoria. GOLDEN MARGUERITE. Per. to 3 ft.: lvs. 2-pinnatisect into oblong or ovate segms.: ray-fls. golden-yellow, in heads to 2 in. across. Eu., Asia. Vars. **pallida** and **alba** are listed.

ANTHER: the pollen-bearing part of the stamen, borne at the top of the filament or sometimes sessile.

ANTHERICUM. *Liliaceæ.* Herbs with tuberous or fleshy roots, linear basal lvs., and small white wheel-shaped fls. in loose racemes terminating slender scapes.

Grown as border plants with protection or in cool greenhouses in pots or benches. Of easy cultivation. Propagated by stolons, division, and by seeds when available.

Bicheti. Lvs. variegated with white. W. trop. Afr.—The botanical identity of this plant is uncertain, as is also that of *Phalangium Bichei* which is probably the same.

comosum: *Chlorophytum comosum.*

elatum: *Chlorophytum elatum.*

Liliago. ST.-BERNARD-LILY. To 3 ft., not branched: lvs. to 1 ft. long: fls. about 1 in. across. Eu. Var. **major** is a larger form.

Liliastrum: *Paradisea Liliastrum.*

Mandaianum: *Chlorophytum elatum.*

picturatum: *Chlorophytum elatum.*

ramosum. To 2 ft., st. branched: fls. smaller than in *A. Liliago.* Eu.

variegatum: *Chlorophytum elatum.*

vittatum: *Chlorophytum elatum.*

ANTHOLYZA. *Iridaceæ.* African summer-blooming herbs with corms, leafy sts. and red or yellow long-tubular fls. in terminal spikes, the perianth-segms. unequal. Cult. as for Gladiolus, to which the plants are related.

æthiopica. To 4 ft.: basal lvs. to 1½ ft. long and 1 in. broad: fls. red-yellow, to 2½ in. long, curved. S. Afr.

ANTHOPOGON: *Gentiana thermalis.*

ANTHOXANTHUM. *Gramineæ.* Ann. and per. grasses adapted to meadows, fragrant when drying, the spikelets in spike-like terminal panicles, florets awned; native of Eu., Asia, and N. Afr. See *Grasses.*

aristatum (*A. Puelii*). Ann. to 1 ft.: lvs. to 4 in. long and ⅛ in. wide: panicles to 1½ in. long, conspicuously awned. Eu.; escaped in E. N. Amer.

gracile. Tufted ann. to 8 in.: lvs. hairy: spikelets ½ in. long, silvery and shining, conspicuously awned, in racemose panicles. Medit. region.

odoratum. SWEET VERNAL-GRASS. Per. to 2 ft.: lvs. to 6 in. long and ¼ in. wide: panicles to 3 in. long, bronzy-green, early. Eu., Asia; nat. in N. Amer.

Puelii: *A. aristatum.*

ANTHRISCUS. *Umbelliferæ.* Herbs with pinnately compound lvs., small white fls. in compound umbels, and compressed frs.; grown for the lvs. which are used like parsley.

They are of easy cultivation in any soil, thriving in shaded situations. Propagated by seeds.

Cerefolium. SALAD CHERVIL. Ann. to 2 ft.: lvs. 2-pinnate, the segms. ovate and deeply cut, giving the foliage a very finely divided appearance: fr. beaked. S. E. Eu., W. Asia; nat. in N. Amer. See *Chervil.*

sylvestris. Per. or bien. to 3 ft.: lvs. 2-pinnate, the segms. ovate-lanceolate and deeply cut: fr. not distinctly beaked. Eu., W. Asia.

ANTHURIUM. *Araceæ.* Trop. American perennials of varied habit, having arrow- or heart-shaped entire or lobed lvs. and bisexual fls. in densely-fld. spadices subtended by widely spreading or reflexed often colored spathes; grown in the greenhouse for the striking foliage or spathes.

Anthuriums require high temperatures, never below 55° in winter, and a humid atmosphere. They thrive in rough fibrous loam and the roots should be kept well covered. Repotting is necessary only every few years with older plants. Propagated by suckers or root-cuttings placed in pots over bottom heat; also by seeds under a bell-glass in a temperature of about 80°.

album. Hybrid with *A. Andrœanum* as one parent, or a variant, having white spathes.

Andræanum. Lvs. oblong-ovate, heart-shaped at base with deep narrow sinus, to 1 ft. long and 6 in. wide, the petiole longer than blade: spathes spreading, cordate, to 6 in. long, orange-red varying to rose or white. Colombia.

bogotense. Lvs. cordate, to 2 ft. long and 16 in. wide, long-acuminate: spathes broadly lanceolate, spreading, 8 in. long, yellowish. Colombia.

Brownii. Lvs. lanceolate-cordate, to 3 ft. long and 20 in. across, shining green above, paler beneath: spathes lanceolate, spreading, 6 in. long, green tinged with purple. Colombia.

carneum. Hybrid between *A. Andrœanum* and *A. nymphœfolium* with rose-colored spathes.

Clarkianum: hort. name.

crystallinum. Lvs. cordate-ovate, to 14 in. long and 10 in. across, deep velvety-green prominently veined with white, pale rose beneath: spathes linear-oblong, to 6 in. long, green. Colombia.

Duchartii: hort. name.

ferrierense. Hybrid between *A. Andrœanum* and *A. ornatum* with ovate-cordate lvs. and spathes, the latter rosy, and white spadices.

Forgeti. Lvs. to 14 in. long and 9 in. wide, peltate, deep velvety-green: spathes to 6 in. long and ⅔ in. wide, green. Colombia.

grande. Lvs. oblong-ovate, to 2 ft. long and 16 in. wide: spathes ovate-cordate, 6 in. long, white or purplish. Bolivia.

illustre: hort. name.

Lowii: hort. name.

magnificum. Lvs. cordate-ovate, to 1½ ft. long and 10 in. wide, olive-green above with prominent white veins, the petioles 4-angled: spathes lanceolate, 8 in. long, becoming recurved, green or reddish. Colombia.

regale. Lvs. cordate-oblong, to 16 in. long and 8 in. wide, very long-acuminate, green above, paler beneath: spathes broadly lanceolate, 3 in. long. Peru.

Reynoldsianum: hort. name.

Scherzerianum. Lvs. oblong-lanceolate, 8 in. long and 2 in. wide, long-pointed, green: spathes broadly ovate, 3 in. long, deep red varying to rose and white; spadix spirally coiled, yellow. Cent. Amer. Var. **giganteum** has larger spathes. Var. **maximum,** spathes scarlet, large. Var. **Rothschildianum** has red spathes spotted with white.

tetragonum. Lvs. oblong to obovate-lanceolate, to 4 ft. long and 1½ ft. wide, glaucous-green above, yellowish below: spathes oblong-lanceolate, to 8 in. long. Costa Rica.

Veitchii. Lvs. long-oblong, to 3 ft. long and 10 in. wide, cordate at base, rich metallic-green with prominent veins: spathes ovate-lanceolate, 3 in. long, erect or becoming reflexed, greenish-white. Colombia.

velutinum. Lvs. cordate, 10 in. long and 6 in. wide, shining green. Colombia.

Warocqueanum. Lvs. cordate-lanceolate, 3 ft. long and 10 in. wide, velvety-green veined with white: spathes linear-lanceolate, reflexed, 4 in. long, green. Colombia.

ANTHYLLIS. *Leguminosæ.* Per. herbs or subshrubs from Eu., N. Afr. and Asia, with pinnate lvs. and papilionaceous fls. in dense clover-like heads; grown for ornament and *A. Vulneraria* for forage in Eu. on poor soils. Propagated by seeds, division and cuttings.

Barba-Jovis. JUPITERS-BEARD. Silky-hairy evergreen shrub to 12 ft.: lfts. to ¾ in. long: fls. yellowish-white. S. Eu.

montana. To 1 ft. or less, white-silky lvs. pinnate, the many lfts. small and entire, oval or oblong: fls. purple or pink, in dense involucrate heads. Alps. Vars. **carminea** and **rubra** are color forms.

tetraphylla. Ann., mostly prostrate: lvs. with large terminal lft. and 2–4 small lateral lfts.: fls. yellowish-white striped with pink. Medit. region.

Vulneraria. KIDNEY VETCH. WOUNDWORT. To 1 ft.: lvs. with terminal lft. 1 in. long, lateral lfts. small or none: fls. yellow to deep red. Eu., W. Asia.

ANTIARIS. *Moraceæ.* Evergreen trees of Malaya and Australia with alternate lvs. and unisexual fls., the staminate in dense heads and the pistillate solitary; one intro. in S. Calif.

toxicaria. UPAS-TREE. To 250 ft., the milky juice poisonous: lvs. oblong, to 8 in. long, entire or slightly toothed: fr. a fleshy purple or red drupe. Malaya.

ANTICLEA: *Zygadenus elegans.*

ANTIDESMA. *Euphorbiaceæ.* Trees and shrubs native in the tropics of the Old World; the bark of some species furnishes cordage and frs. are sometimes edible: lvs. alternate, simple: fls. diœcious, without petals, in spikes or racemes: fr. a small fleshy drupe. Sometimes cult. for ornament in warm regions. Propagated by cuttings.

Bunius. BIGNAY. Evergreen tree to 30 ft.: lvs. oblong, shining, to 6 in. long: fls. green, in spikes: frs. currant-like, red, often made into preserves. India, Malaya.

ANTIGONON. *Polygonaceæ.* Tendril-climbing vines with alternate entire lvs. and red, pink, white or yellowish fls. in racemes terminating in a tendril.

One species is commonly grown in warm climates to cover verandas, bushes and fences. Of easy cultivation, but the soil should not be too rich, for the best bloom; it may also be grown in a warm light greenhouse. Propagated by seeds and cuttings.

africanus: an erroneous name.

leptopus. CORAL-VINE. PINK-VINE. CORALLITA. CONFEDERATE-VINE. ROSA DE MONTANA. Climbing to 40 ft.: lvs. arrow-shaped or cordate-ovate: fls. bright pink, in axillary racemes. Mex. Var. **albus** has white fls.

ANTIPHYLLA: *Saxifraga oppositifolia.*

ANTIRRHINUM. SNAPDRAGON. *Scrophulariaceæ.* Erect, climbing or procumbent herbs usually grown as annuals, with sac-shaped 2-lipped fls. in rose, red, purple, yellow and white.

The snapdragon grown in gardens and for cut-flowers in greenhouses is *A. majus.* For the garden, treat the same as any annual. Plants sometimes winter over, if well protected, and bloom early in spring. For greenhouse culture the seed for the first lot is planted in July; by successive sowings the grower may have snapdragons all the year.

angustifolium: *A. siculum.*

antirrhiniflorum: *Maurandia antirrhiniflora.*

Asarina. Procumbent per., sticky-pubescent: lvs. cordate-ovate and crenate, 5-lobed or -nerved: fls. white or pinkish, 1½ in. long, solitary. S. W. Eu.

assurgens: *A. siculum.*

Coulterianum. Chaparral S. Ann. to 3 ft., erect or climbing, glabrous except the infl.: basal lvs. ovate, to 1¼ in. long, entire: fls. purplish to white with yellowish hairy palate, ⅓ in. long, in spike-like racemes. Calif.

glandulosum. Viscid erect per. to 5 ft.: lvs. lanceolate, sessile, to 2½ in. long, those on sterile shoots linear: fls. pink, in dense racemes, to ¾ in. long. Calif.

glutinosum. Prostrate much branched per., sticky-pubescent: lvs. oval, entire: fls. yellowish-white with lip red-striped, in racemes. Spain.

Huetii: *A. sempervirens.*

majus. Common or Large S. Per. to 3 ft., glabrous except infl.: lvs. lanceolate or oblong-lanceolate, to 3 in. long, entire: fls. purplish-red varying to white and other colors, to 1½ in. long, in long terminal racemes. Medit. region; escaped in E. U. S. Forms in the trade are grouped under Tall, 2–3 ft., Intermediate or Half Dwarf, 15–18 in., Dwarf or Tom Thumb, 6–9 in.

maurandioides: *Maurandia antirrhiniflora.*

Nuttallianum. Ann. to 3 ft., climbing, sticky-pubescent: lvs. broad-ovate, to 2 in. long: fls. blue or violet with white spot on lower lip. S. Calif.

Orontium. Ann. to 1 ft., glabrous or pubescent: lvs. linear, to 2 in. long: fls. purple, ½ in. long, solitary. Eu., Asia; escaped in N. Amer.

sempervirens (*A. Huetii*). Evergreen procumbent much branched per., tomentose: lvs. ovate or oblong: fls. white spotted purple, with yellow throat. Pyrenees.

siculum (*A. angustifolium. A. assurgens*). Much branched per. to 2 ft., pubescent or glabrous: lvs. linear-lanceolate, to 1½ in. long: fls. white or yellowish with yellow throat, to 1 in. long, in racemes. Medit. region.

speciosum: *Galvezia speciosa.*

ANYCHIA: *Paronychia argyrocoma.*

APETALOUS: lacking or without petals.

APHANES: *Alchemilla arvensis.*

APHANOSTEPHUS. *Compositæ.* Ann. or bien. herbs having alternate lvs. and solitary fl.-heads with white, violet or purple ray-fls. and golden disk-fls.; pappus a crown.

skirrobasis. To 1½ ft.: lvs, spatulate to linear, to 2½ in. long, gray-pubescent, the lower toothed or cut; ray-fls. white, to 1 in. across. Tex. to Fla.—Adapted to the flower-garden, with the look of erigeron.

APHELANDRA. *Acanthaceæ.* Trop. American herbs or shrubs with opposite simple lvs. and yellow, orange or red 2-lipped fls. in dense terminal spikes with large overlapping bracts.

Aphelandras are grown under glass for the showy bracted spikes and are of easy cultivation. After blooming the plants should be rested. Propagated by cuttings of half-ripened wood or of young growth with a heel, and by seeds when obtainable.

aurantiaca. Lvs. ovate to oblong, to 1 ft. long, deep green above, pale beneath: fls. orange, 2½ in. long, in spikes to 6 in. long. Mex. to S. Amer.

Leopoldii: *A. squarrosa.*

squarrosa (*A. Leopoldii*). Lvs. ovate, to 1 ft. long, dark green veined with white above: fls. pale yellow, 1½ in. long, in spikes to 1 ft. long, bracts orange-yellow. Brazil.

tetragona. Lvs. oval, to 9 in. long, green: fls. scarlet, 2 in. long, the lateral lobes of lower lip very small, in clustered spikes to 8 in. long. W. Indies, S. Amer.

APIO: *Arracacia xanthorrhiza.*

APIOS. *Leguminosæ.* Tuberous-rooted twining herbs with pinnate lvs., papilionaceous fls. in short racemes, and long flat pods; native in E. N. Amer. and Asia, one sometimes grown in the wild-garden. Propagated by tubers and by seeds.

tuberosa (*Glycine Apios*). Groundnut. Potato Bean. Wild Bean. To 8 ft., the roots with strings of tubers: lfts. 5–7, to 3 in. long: fls. brown, fragrant, in late summer. N. B. to Fla. and Tex.

APIUM. *Umbelliferæ.* Herbs with pinnately compound lvs., small white fls. in compound umbels, and compressed frs.; one species is a common vegetable grown for the blanched lf.-stalks and a var. for the edible roots. See *Celery.*

graveolens var. dulce (*Celeri graveolens*). Celery. Bien. to 3 ft., strong-smelling: lvs. pinnate, each of the 5–7 lfts. ternately compound and often again divided or toothed. Widely distributed. Var. rapaceum, Celeriac, has thickened turnip-like edible root-crown.

Petroselinum: *Petroselinum hortense.*

APLECTRUM. *Orchidaceæ.* One N. American terrestrial species, sometimes transplanted to the wild-garden or border. **A. hyemale** (*A. spicatum*). Putty-Root. Adam-and-Eve. Lf. to 6 in. long and 3 in. wide, arising from the corm: fls. yellowish-brown, with narrow sepals and petals and 3-lobed lip, borne on racemes to 4 in. long on leafless scapes to 1 ft. high, May–June.

APLOPAPPUS: *Ericameria ericoides.*

APOCYNACEÆ. Dogbane Family. Herbs, shrubs and trees, sometimes vines, of about 130 genera most abundant in trop. countries, grown for ornament or a few for the edible fr. The family is characterized by the prevailingly milky juice, regular fls. with gamopetalous corolla, sagittate anthers, single style, and fr. usually of 2 long follicles; from Asclepiadaceæ the family is distinguished by the absence of corona in the corolla, separate filaments, and anthers not connected with the stigmas, and other technical characters. Genera herein treated are Acokanthera, Allamanda, Alstonia, Alyxia, Amsonia, Apocynum, Aspidosperma, Beaumontia, Carissa, Dipladenia, Echites, Ervatamia, Mandevilla, Mascarenhasia, Nerium, Plumeria, Tabernæmontana, Thevetia, Trachelospermum, Vallaris, Vinca.

APOCYNUM. Dogbane. *Apocynaceæ.* Per. herbs with milky juice, tough fibrous bark, opposite entire lvs., small white or pink bell-shaped fls. with appendages in the throat, borne in cymes, and long slender frs.; sometimes planted in the hardy border and the roots have medicinal qualities; propagated commonly by division.

androsæmifolium. Spreading D. To 4 ft.: lvs. to 4 in. long and 2½ in. wide, pale beneath: fls. pinkish, ⅓ in. across. N. Amer.

cannabinum. Hemp D. Indian Hemp. To 8 ft.: lvs. to 6 in. long and 3 in. wide: fls. greenish-white. Conn. to Wis. and Kans.

APONOGETON. The only genus of *Aponogetonaceæ.* Aquatic per. herbs from Asia, Afr. and Australia, with tuberous rootstocks, floating or submerged lvs., fls. in spikes, and fr. of 3 or more hard follicles.

Aponogetons are grown in ponds in the greenhouse, or *A. distachyus* out-of-doors although tender North. They should be potted and plunged 1½ to 2 feet under water. Temperatures of 65–70° should be given *A. fenestralis*. Propagated by division, offsets, or by seed when available. The flowers should be pollinated and kept above water to produce good seeds.

distachyus. CAPE POND-WEED. WATER-HAWTHORN. Lvs. floating, solid, linear-oblong. Cape of Good Hope. Var. **Lagrangei** has lvs. violet beneath and fls. with violet instead of white bracts. Var. **giganteus** is an improved form.

fenestralis (*Ouvirandra fenestralis*). LACE- or LATTICE-LEAF. Lvs. submerged, only a network of veins, broad-oblong. Madagascar.—Grown in tubs or under protected conditions.

APOROCACTUS. *Cactaceæ.* A small genus of slender creeping, hanging or clambering vine-like diurnal cacti, emitting aerial roots: fls. rather small, solitary on the areole, funnelform, pink or red: spines several at each areole, small. See *Cacti.*

Conzattii. Sts. ½–1 in. diam., with 8–10 rather prominent ribs: fls. nearly straight, to 3½ in. long, red, inner perianth-segms. acute but not acuminate. Mex.

flagelliformis (*Cereus flagelliformis*). RAT-TAIL CACTUS. Sts. ½ to nearly 1 in. diam., with 10–12 ribs: fls. strongly bent just above ovary, about 3 in. long, crimson, outer segms. more or less reflexed. Probably Mex.; undiscovered wild.—A good window, conservatory and basket plant; often grafted on other and erect cacti, also hybridized with other species; of easy cult.

Martianus (*Cereus Martianus*). Much like *A. Conzattii* but fls. deep rose-color and inner perianth-segms. long-acuminate: sts. to ¾ in. diam. Mex.

APPLE. All the common cultivated varieties of apple are forms of *Pyrus Malus* (or *Malus sylvestris*), probably native in Europe and southwestern Asia. The paradise (or "garden," as the name signifies) apple is a bush or small-stature form of the same species, on which common varieties are sometimes budded or grafted to prevent the trees from growing large or to dwarf them. The true crab-apples are *Pyrus baccata*, and some of the larger crabs may be hybrids between the two species. Other species may be involved in the long development of the domesticated apple, but this subject is not yet sufficiently understood. See *Pyrus Malus.*

The great variation in the adaptability of varieties of apple to different soils and climates makes its cultivation possible over a wider range of territory than with most other temperate zone fruits. Commercial orchards are located as far south as the mountains of Georgia and New Mexico and north into Maine, Wisconsin, and parts of Canada. In home plantings, by careful choice of varieties, the range is much wider, extending from the Gulf states to the more rigorous climates of the northern plains states. The larger commercial plantations, however, are localized in regions particularly well adapted to the apple, as, for example, western New York, the Shenandoah-Cumberland Valley and the valleys of the Pacific Northwest, and others.

Soils for the apple are of wide range. Although some apple varieties are restricted to certain soil types for their best development, most kinds will succeed on any good agricultural soil that is fairly deep and well-drained. Friable, rather heavy, sandy, or gravelly loams with good humus content and with an open subsoil are considered ideal. In general, for any given variety, climate is of much more importance than soil type, provided the soil is at all suitable.

Propagation of named varieties is by either budding or grafting on one-year apple seedlings, either French or American grown. For budding, the seedlings are set out in early spring in the nursery row, and the buds set in July and August when the bark of the stock slips readily. Early the following spring the stocks are cut off above the bud forcing it into vigorous growth. Root-grafting is a common practice in the southern nurseries. Cions 4–6 inches long are whip-grafted on either whole or piece roots in the winter and the grafts stored. In early spring the grafts are planted out and make two-year trees at the end of the second season. Root-grafted trees are preferable for planting hardy varieties in cold climates because the graft union is below the surface of the ground and thus the tender stock is protected from the cold.

Planting is undertaken with either one- or two-year nursery trees. These are best set out in the early spring in the northern states but may be set in the fall to advantage in milder climates. The standard planting distance on good soils for vigorous sorts, such as Baldwin and Greening, is 50 x 50 feet. On light soils or with weaker-growing varieties, such as Wealthy or Wagner, 35 feet is ample. A common commercial practice is to plant filler trees of early bearing varieties between the permanents. These are removed after twelve to fifteen years, when they begin to crowd. The most important consideration in planting trees is to tamp the soil firmly about the roots.

Tillage and fertilizers are various. Apples can be grown successfully under either sod or tillage. The latter method is usually followed in commercial orchards where the soil is readily tillable, and consists of annual fall or spring plowing followed by three or four cultivations with disk or harrow in the early spring. The last cultivation should be about July first after which a natural cover-crop of weeds or sowed crop, such as buckwheat, rape, or vetch, is allowed to grow. In sod culture, which is adapted to home plantings and where the land is too rough or stony for tillage, the trees are allowed to grow in a natural sod of grass, or one composed of sowed clover or alfalfa. This is mowed once or twice a year and the mowings either allowed to lie where they fall or placed about the tree as a mulch. Trees growing in sod must be fertilized with manure or commercial nitrates if good yields are to be obtained. Sodium nitrate, or ammonium sulfate, at the rate of 8–10 pounds to a mature tree, applied just as the buds open, is effective.

Younger trees, of course, require much less, as for example, 2–4 pounds for a ten-year-old tree. The nitrate should be spread under the ends of the branches, not next the trunk. Cultivated trees need no fertilizer of any kind except on very poor soils where nitrate may be beneficial to the tree, or a complete fertilizer may be used to increase the growth of the cover-crop and so benefit the trees indirectly by increasing the supply of humus.

Pruning at time of setting the one-year whip consists in heading at the desired point, 30 to 50 inches being a satisfactory height. In the case of two-year trees all lateral branches are cut off except one upright growing shoot at the top, called the leader, and one to three others spaced as far apart as possible along the main stem. A good practice is to head these back about a third of their length, leaving the uppermost branch the longest. From this time until the tree comes into bearing it should be pruned as little as possible, removing only suckers and such branches as interfere with the development of the framework of the tree. When the trees are in full bearing and especially with old trees, the tops must be thinned to reduce the number of fruit-spurs and to prevent injury to the lower limbs by shading. Dead or diseased limbs, those that rub others badly, and suckers should be removed as soon as discovered. If trees are too tall they may be headed back to vigorous side branches. Apple trees may be pruned at any time when they are dormant.

Harvesting, marketing, and yields require few special comments. The apple crop is hand-picked into bags or buckets, when the fruit is mature but still firm. The degree of care necessary in handling varies with the variety. Tender fruits like McIntosh should never be poured from one container to another, whereas Baldwin and Ben Davis may, with care, be handled in that way. Marketing is done in various ways. Recently much fruit has been sold in roadside markets, at the farms. Where the markets are near, the crop, packed in bushels or hampers, is trucked directly to the wholesaler or to retail stores. In most of the large fruit districts, however, the fruit goes to the general market, either in barrels or boxes. Under good cultural conditions, early bearing varieties such as Wealthy and McIntosh begin bearing four to six years after planting and by the tenth year may yield 5–15 bushels to a tree in the bearing year. Late bearing varieties like Northern Spy may not fruit until after eight to ten years in the orchard. Mature trees may yield from 10 to 50 bushels in a single year. On the average, however, 15 to 20 bushels to a tree or 300 to 500 bushels an acre are considered good yields.

Storage should be provided as soon as the crop is off the trees, if it is to be kept for any length of time. The best cold storage temperature is about 31° F. Apples will not freeze above 29° F. Fruit can be stored fairly well for home use in outside storage cellars or in a special compartment of the house cellar. In either case the temperature should be kept as near as possible to 31° F. by regulating ventilators or windows. An earth floor in such a storage will aid in keeping the air moist. Sprinkling the floor now and then with water may be necessary to keep the fruit from shrivelling.

Varieties are numberless but the commercial kinds are not numerous. The choice of suitable varieties for planting in different regions is of the greatest importance. The following lists include most of the best varieties arranged in order of ripening and are chosen to give a succession for the home planting. Commercial varieties are starred (*).

Varieties of more than average hardiness adapted to the northern states or cold situations: Yellow Transparent,* Red Astrachan, Gravenstein,* Oldenburg,* Wealthy,* McIntosh,* Fameuse, Pewaukee, Winter Banana, Delicious,* Tolman Sweet, Northern Spy.*

Varieties of medium hardiness adapted to such regions as western New York and Michigan: Yellow Transparent, Red Astrachan, Oldenburg,* Chenango, Maiden Blush, Wealthy,* McIntosh,* Rhode Island Greening,* Mother, Baldwin,* Sweet Winesap, Stark,* Red Canada,* Delicious,* Northern Spy.*

Varieties adapted to the southeastern states, especially the Shenandoah-Cumberland Valley and the Eastern Shore: Yellow Transparent,* Red June,* Williams Favorite,* Summer Rambo,* Grimes Golden,* Jonathan,* Stayman Winesap,* Winesap,* York Imperial,* Yellow Newtown.*

Varieties adapted to the southern and Gulf states: Red Astrachan, Red June, Hackworth, Rome, Delicious, Arkansas, Winesap, York Imperial, Yates, Terry, Romanite.

Varieties for the Middle West: Yellow Transparent,* Red Astrachan, Oldenburg, Benoni,* Maiden Blush, Wealthy, Jonathan,* Grimes Golden,* Delicious,* Ben Davis, Missouri Pippin.

Varieties for the Pacific Coast and Rocky Mountain states: Red Astrachan, Gravenstein,* Jonathan,* Winesap,* Stayman Winesap,* Ortley,* Esopus,* Winter Banana, White Winter Pearmain, Grimes Golden, Delicious,* Golden Delicious,* Arkansas Black.

In the parts of Canada bordering the Great Lakes the varieties recommended for Michigan and the northern states are satisfactory. The following list is made up of the hardiest varieties that will stand extreme cold: Tetofsky, Oldenburg, Charlamoff, Whitney, Wealthy, Hibernal, Longfield, Patten Greening, McIntosh, Milwaukee, Baxter, Scott Winter.

To insure cross-pollination, several varieties of apples should be planted together, in blocks more than three rows wide. Although most varieties are satisfactory sources of pollen, Baldwin, Gravenstein, Winesap, Rhode Island Greening and a few others are exceptions and should not be relied on as pollinizers. In commercial orchards, yields can often be increased by bringing in colonies of bees at blooming time to distribute pollen. One strong colony to every two or three acres is considered to be sufficient.

Of the many diseases affecting the apple the most important is apple scab which may cause many of the blossoms to drop off, and disfigure fruit and leaves. The most important pest is the codlin-moth which is responsible for most wormy apples. Other insects of lesser, though often of great importance, are the San José scale, apple red-bugs, aphids, apple maggots, borers, and a number of caterpillars. The control of these pests and diseases is a complicated problem in which the commercial grower needs expert guidance based on a knowledge of the pests present and their stage of development. In home orchards of many localities, reasonably good control of scab and codlin-moth and other chewing insects can be obtained with three sprays. The first, called the delayed dormant spray, should be applied just as the tips of the buds are showing green, the second or calyx spray just after the petals have fallen, and the third about two or three weeks later. Liquid lime-sulfur, 1 gallon to 40 of water with 1 pound of powdered arsenate of lead added, may be used in all of these sprays. Scale can be controlled by using lime-sulfur, 1 gallon to 8 of water in the delayed dormant spray. Aphids, red-bugs, and other sucking insects can be kept in check by adding ½ pint of nicotine sulfate to 50 gallons of spray. The delayed dormant is the most effective spray for aphid control, the calyx for red-bugs. If only one spray can be applied, the calyx application is of the most importance.

In many regions east of the Rocky Mountains borers are a serious pest. These are found at the base of young trees where their presence is indicated by sawdust-like fragments of wood on the ground next the trunk, or by dark sunken areas in the bark. An effective control is to dig out the grubs with a sharp knife, or to kill them by forcing a wire into the burrow. This should be done in September and again in the early spring.

Mice frequently cause great damage, especially in the sod orchard, by girdling the young trees at the base. Effective protection may be secured by placing guards of ½-inch mesh wire netting about the trees. A piece of netting 15 x 18 inches will make a guard that will be adequate until the tree is 5–6 inches in diameter. Pine mice, if present in the region, may dig under such guards; they may be controlled by poisoned bait (oats and strychnine) placed in the burrows.

APPLE, BALSAM-: *Momordica Balsamina.* **Custard-**: *Annona reticulata.* **Kei-**: *Dovyalis caffra.* **Malay-**: *Eugenia malaccensis.* **Mammee-**: *Mammea americana.* **May-**: *Podophyllum.* **-of-Peru**: *Nicandra Physalodes.* **Otaheite-**: *Spondias cytherea.* **Pond-**: *Annona glabra.* **Rose-**: *Eugenia Jambos.* **Star-**: *Chrysophyllum Cainito.* **Sugar-**: *Annona squamosa.* **Vi-**: *Spondias cytherea.* **Wood-**: *Feronia Limonia.*

APRICOT. A stone-fruit, ripening mostly in advance of peaches, pubescent or smooth at maturity, with a flat stone or pit that is not corrugated or furrowed on the side; much prized as a summer fruit in the regions where it is grown, also for dessicating and canning. It is about as hardy as the peach. The apricot is of one prevailing species, ***Prunus Armeniaca,*** native in China, the so-called Russian race being small-fruited hardy kinds adapted to severer winters than the usual large-fruited commercial kinds. The Japanese ***Prunus Mume*** yields a few fruit-bearing varieties, as Bungo and Bungoume, but it is not greatly grown except as an ornamental tree for its early bloom (the "plum flowers" of Japan).

Regions of apricot-growing are determined largely by the early blooming period and consequent damage from late spring frosts. Its cultivation, therefore, is confined mostly to regions where such frosts are not common. Commercially it is grown on the Pacific Coast, and in some of the Rocky Mountain states, about 95 per cent of the crop being produced in California. In home gardens it is planted sparingly wherever peaches thrive, and while not dependable in bearing gives occasional crops and in some cases may supply local markets.

Soil and planting for apricot depend somewhat on the stocks on which the tree is worked. Light soils are best in the case of peach and apricot stocks, whereas plum stocks adapt the apricot for growth upon the heavier soil types. As with other fruits, good drainage is necessary. One- or two-year trees are planted in the early spring in the East and in the late fall in California. The common planting distance is 24 x 24 feet.

Cultivation, cover-crops, and in the West irrigation, are the common commercial practices, as with the peach. Trees in the home planting should be mulched to keep down the grass and if growth is not fairly vigorous they should be fertilized with manure or 2–3 pounds of nitrate to a tree, applied early in the spring.

Propagation is by budding on apricot, peach or myrobalan stocks. Apricot stocks are considered best in the West and peach or plum is used in the East.

Pruning is simple. The young trees are pruned to give them a balanced head with four to five well-spaced scaffold limbs. In California the trees are thinned out by removing the crowding branches without severe heading. In the East they can be pruned much the same as the peach, but the pruning should not be as severe.

Harvesting and marketing are much as for the peach. For home use the fruit ripens on the tree to advantage. Commercially, for shipping and canning, it is hand-picked, preferably with the stems attached, while still firm but full size and just beginning to take on the yellow color. For drying the fruit is allowed to become riper but not soft and in some cases is shaken from the trees. For eastern shipment, apricots are packed in five-pound baskets, four baskets to the crate, and sent through in iced cars. Storing this fruit for any length of time is not practicable.

Varieties recommended for planting in the East are the Early Moorpark, Early Golden, Helmskirk, Moorpark and Peach. In California the Newcastle, Blenheim, Royal, Tilton, Peach, Helmskirk and Moorpark are among the most important. For the northern limits of apricot-growing, the Russian varieties are to be recommended.

Pests and diseases are several, but two of them may be mentioned. Curculio and brown-rot are difficult to control in the case of the apricot. In the East the same spray program recommended for the peach is of value. Borers can be controlled with paradichlorobenzine as with the peach, using about ¾ ounce to a tree. In the commercial orchards of the West the spray program is more complex and special practices with expert guidance are advised.

APPRESSED: closely and flatly pressed against, as bracts applied to or appressed against a stem; adpressed.

APTENIA. *Aizoaceæ.* Monotypic S. African genus, separated from Mesembryanthemum mostly by technical characters of fr.; calyx lobed to the ovary; parts of caps. lacking wings or flaps. Frequently seen in conservatories and window-gardens. For cult. see *Mesembryanthemum.* **A. cordifolia** (*M. cordifolium*). Diffuse per., sts. to 2 ft. long, minutely papillose: lvs. opposite, flat, ovate, to 1 in. long: fls. purple, about ½ in. across. Var. **variegata** has variegated lvs.

AQUATICS are plants that pass their life in deep water; the word is frequently but improperly employed for those that grow in bogs, swamps and about the borders of ponds and lakes. The true aquatic plants usually have floating parts, and some of them are not permanently attached to the bottom. See *Bog Plants.*

AQUIFOLIACEÆ. Holly Family. Three genera of trees and shrubs, sometimes evergreen, with alternate simple lvs., small fls. with mostly 4–6 sepals, petals and stamens, a superior ovary, and fr. a berry-like drupe. Ilex and Nemopanthus are cult. for ornament.

AQUILEGIA. Columbine. *Ranunculaceæ.* Hardy per. herbs with attractive ternately compound lvs. and spurred fls. in white, yellow, blue, lavender, red.

Columbines are favorites in rock-gardens and the perennial border. They thrive in light sandy loam and some of them in shaly soils. Propagated by seed or by division in the spring; seeds sown in spring should give good blooming plants the following year. The clumps should stand 12–18 inches apart. Protection from strong winds favors their development and safeguards the bloom.

The common garden aquilegias do not belong to clearly recognized species; they are mutants or hybrids. Probably *A. glandulosa, A. vulgaris, A. sibirica, A. cærulea, A. chrysantha,* and *A. Skinneri* are the main parents. The Old World species are characterized by strongly hooked spurs and the American kinds (except certain undomesticated ones in the Rocky Mountains and westward) by straight or at least not hooked spurs although there may be a knob at the end. It is supposed that the character of the spur in the horticultural kinds is an indication of parentage. The "long-spurred hybrids" are now popular.

akitensis. Fls. with pale purple sepals and pale yellow petals, the spurs nearly straight. Japan.

alpina. To 1 ft.: fls. blue, to 2 in. across, with incurved spurs about length of petal-limb and sepals twice as long, July–Aug. Switzerland. Var. **alba**, fls. white. Var. **superba** does not differ from the type.

arctica: *A. formosa.*

baikalensis: hort. name for a form with large violet-blue long-spurred fls.

Bertolonii (*A. Reuteri*). To 1 ft., alpine: lvs. small, glaucous: fls. about 1 in. across, blue-violet; spurs very short, knobbed. S. Eu.

bicolor: *A. sibirica.*

cærulea. Colorado C. To 3 ft.: fls. to 2 in. across, the blue-purple sepals longer than white petal-limbs; spurs to 2 in. long, straight or spreading, knobbed at end, May–June. Rocky Mts.; the state fl. of Colo. Vars. **alba** and **candidissima** have white fls., **citrina** yellowish, **Helenæ** blue and white, **hybrida** and **lutea** sepals blue or pink and petals white or yellow. There is a wild var. *albiflora* with white fls.

californica: *A. formosa.*

canadensis. Common American C. To 2½ ft.: fls. 1½ in. across, with yellowish or red sepals about as long as yellowish petal-limb; spurs red, nearly straight, knobbed at end, to ¾ in. long, May–July. N. S. to Fla. and Tex. Var. **nana**, 1 ft. high. Var. **flavescens**, fls. yellow.

chrysantha. Golden or Golden-spurred C. To 4 ft., much branched: fls. to 3 in. across, yellow, the sepals much longer than petal-limb; spurs straight, to 2½ in. long, May–Aug. Rocky Mt. region and Tex. Some of the vars. are: **alba**, fls. whitish, **alba-plena** (var. *grandiflora alba*), fls. whitish, partly double; **flavescens**, fls. tinged with red; **flore-pleno**, fls. double; **grandiflora sulphurea**, fls. deep yellow; **Jæschkanii**, Red-spur C., dwarf, with red spurs, probably a hybrid; **nana**, dwarf.

clematiquilla. Fls. large, white, with long spurs; hort. form.

elegantula. To 16 in., usually with only 1 lf.: fls. yellow, with straight scarlet spur to ¾ in. long. Colo., Utah, New Mex.

eximia: a synonym of *A. formosa.*

flabellata. Fan C. To 1½ ft.: fls. 2 in. across, nodding, lilac, sepals twice as long as petal limb which is often white; spurs incurved, shorter than petal-limb, summer. Japan. Var. **nana-alba** (var. *flore-alba*) is dwarf with pure white fls.

flavescens: *A. canadensis* var., *A. chyrsantha* var.

florariensis: hort. name.

formosa (*A. arctica*). Sitka C. To 3 ft.: fls. to 2 in. across, nodding, the red sepals twice as long as yellow petal-limb; spurs red, straight, about length of sepals, May–Aug. Calif. to Alaska and Siberia. Var. **hybrida** (*A. californica* var. *hybrida, A. superba*), supposed hybrid between *A. formosa* and *A. chrysantha.* Var. **nana-alba**, dwarf, pale sometimes nearly white. Var. **rubro-plena**, fls. double. Var. **truncata** (*A. truncata, A. californica*), petal-limb very short.

glandulosa. Altai C. To 1½ ft.: fls. to 3 in. across, nodding, lilac-blue, the sepals twice as long as the white-bordered petal-limb; spurs much incurved, ½ in. long, spring, early summer. Siberia. Var. **jucunda** (*A. jucunda*), fls. somewhat double, with white petal-limb.

haylodgensis. A blue-fld. race with long spurs; hort. form.

Helenæ: *A. cærulea* var.

hybrida. A name of uncertain application to include hybrids between several species.

Jæschkanii: *A. chrysantha* var.

jucunda: *A. glandulosa* var.

longissima. To 3 ft.: fls. pale yellow, the sepals longer than petals, the spurs 5 in. and more long, July–Oct. S. W. Tex., Mex.

lutea. Probably a hybrid between *A. cærulea* and *A. chrysantha.*

nivea: *A. vulgaris* var.

olympica: *A. vulgaris* var.

oxysepala. Early C. To 2½ ft.: fls. to 1½ in. across, with blue sepals much exceeding the white petal-limbs; spurs bent inward, knobbed, shorter than petal-limb, June. Siberia.

pubescens. To 1½ ft.: fls. about 1 in. across, erect, cream-yellow varying to white or pink, spurs 1 in. long. Calif.

pubiflora. A soft-pubescent form of *A. vulgaris* with short spurs. Himalayas.

pyrenaica. To 1 ft.: fls. deep blue, about 2 in. across, the sepals about length of petal-limb, the spurs short and incurved, June–July. Pyrenees.

Reuteri: *A. Bertolonii.*

sibirica (*A. bicolor*). Siberian C. To 2 ft.: fls. to 3 in. across, lilac-blue, the sepals twice as long as petal-limb; spur very incurved or even coiled, to ¾ in. long, summer. E. Siberia. Var. **flore-pleno**, fls. double. Var. **spectabilis** (*A. spectabilis*), fls. large, with tips of petal-limbs yellow.

Skinneri. Mexican C. To 3 ft.: fls. about 1½ in. across, nodding, the greenish-yellow sepals much longer than yellowish petal-limb; spurs pale red, straight, to 2 in. long, July–Sept. Mts. Mex., Guatemala. Var. **flore-pleno** has double fls.

spectabilis: *A. sibirica* var.

stellata: *A. vulgaris.*

Stuartii. Hybrid between *A. glandulosa* and *A. vulgaris* var. *olympica;* fls. lilac-blue, very large, spurs incurved, May–June.

superba: *A. formosa* var. *hybrida.*

truncata: *A. formosa* var.

Vervæneana: *A. vulgaris* var.

virdiflora. To 1½ ft.: fls. about 1 in. across, greenish, sepals and petals about equal; spurs straight, ½ in. long, summer. Siberia.

vulgaris (*A. stellata*). European C. To 2½ ft.: fls. to 2 in. across, nodding, blue, purple, white, the sepals longer than petal-limb; spurs knobbed and much incurved, about length of petal-limb, summer. Eu., Siberia. Vars. **alba-plena** and **flore-pleno** have double fls. Var. **hybrida** is probably a cross between *A. canadensis* and *A. vulgaris*, with lilac-purple spurs. Var. **nivea** (var. *alba*), Munsteads White C., fls. large, pure white. Var. **olympica** (*A. olympica*, *A. Wittmanniana*), sepals lilac, petal-limb white. Var. **Vervæneana**, lvs. lined with yellow.

Wittmanniana: *A. vulgaris* var. *olympica.*

ARABIS. Rock-Cress. *Cruciferæ.* Annuals, biennials and perennials, mostly low, with white, pink or purpls fls. in terminal spikes or racemes, pods or siliques long and narrow; more than 100 species in widely separated temp. regions, a few native to Amer.

Some of the rock-cresses are alpine, grown in the border or rock-garden. They require plenty of sun but many of them thrive even in poor soil. They are prevailingly spring and early summer bloomers. Some of them produce attractive mats of late-season foliage. Propagated by division, seeds or cuttings.

albida. Wall R. Tufted whitish soft-pubescent per. to 1 ft.: lvs. spatulate and tapering to base, 1–3 in. long, coarsely toothed on upper broad part: fls. to ½ in. long, white, in early spring, fragrant, in loose racemes. Caucasus.—Sometimes double-fld., and forms with vari-colored foliage. There are also compact forms.

alpina. Mountain R. Per., mostly more slender than above and less pubescent: lvs. oblong to oblong-acute, broad at base, sharply toothed along sides: fls. smaller, white. Mts., Eu.—Apparently not common in cult., the stock usually grown under this name being *A. albida.*

Allionii. Per.: lvs. glabrous, ovate-oblong and somewhat toothed, those on st. ovate and sessile: fls. white, with erect petals. Italy.

arenosa. To 6 in., hairy: lvs. pinnatifid, upper ones toothed: fls. rose, sometimes white or bluish, on spreading pedicels. Eu.

aubretioides. Densely tufted little per., either somewhat tomentose or green: lvs. very small, obovate and obtuse, those on st. ovate and clasping: fls. purple. Asia Minor.

bellidifolia. Per. to 9 in.: lvs. glabrous, spatulate or those on st. oblong-ovate and sessile, sparingly toothed: fls. white, in short racemes. Pyrenees, Alps.

Ferdinandi-Coburgi. Small: lvs. in gray rosettes that become green in winter: fls. small, yellowish. Macedonia.

glabra. Bien., strictly erect, to 4 ft., glabrous above, glaucous: lvs. oblong to oblanceolate, dentate, on sts. sagittate and sessile: fls. yellowish-white, small: pods erect-appressed. N. B. to Pacific Coast, south to Pa., Eu., Asia.

Halleri. Slender weak pubescent or nearly glabrous bien. to 1 ft.: lvs. lyrate with large terminal lobe, on st. oblong or lanceolate and toothed: fls. apparently purple. Hungary.

hirsuta. Bien., erect, to 2½ ft., mostly hairy-pubescent: lvs. spatulate and dentate, on st. oblong and clasping: fls. greenish-white, small. Widely distributed in N. Amer., Eu., Asia.

Koehleri. Per. to 6 in.: lvs. narrow-lanceolate to spatulate, to 1 in. long, entire, on st. few and very narrow: fls. scarlet, to ½ in. long, in short racemes. Ore.

Lyallii. Per. to 10 in., mostly glabrous: lvs. spatulate to narrow-oblanceolate, to 1 in. long, entire, on st. narrow: fls. rose, ¼ in. long. N. W. U. S., B. C.

mollis. Per. to 2 ft., lightly pubescent, erect, little branched: lvs. ovate or roundish, cordate and blunt-dentate, long-petioled, on st. clasping: fls. white, in terminal racemes. Caucasus.

muralis (*A. rosea*). Bien. or per., tufted at base, pubescent, to 10 in.: lvs. spatulate and dentate, on st. oblong and sessile: fls. white or rose, in elongating terminal racemes. S. Eu.

procurrens. Per. to 1 ft., with creeping stolons: lvs. oblong to lanceolate or obovate, entire, pointed: fls. white, in elongating racemes. S. E. Eu.—There is a form with vari-colored foliage.

rosea: *A. muralis.*

Stelleri. Small: lvs. oblong or spatulate, the upper ones toothed and partly clasping: fls. white, in a corymbose raceme. E. Asia.

stricta. Per. to 6 in., nearly glabrous: lvs. thickish and shining, oblong, crenate, radical ones in rosette, on st. small and sessile: fls. yellowish-white, in short racemes. Eu.

Sturii. Compact garden plant with large clear white fls.: botanical position uncertain.

ARACEÆ (sometimes written Aroideæ). Arum Family. Aroids. Over 100 genera widely distributed (but most abundant in trop. countries), of varied habit and foliage but characterized by the infl. which is composed of a densely-fld. spadix having the staminate fls. at the top and the pistillate below, and subtended by a bract or spathe which is often colored and showy and constitutes (as in the florist's calla) the ornamental part of the plant: fls. without perianth or these parts merely scale-like; stamens 1-many: fr. a berry borne tightly on the spadix. The family furnishes many plants grown for ornament, curiosity and food; some of them are prominent "foliage plants." All are essentially herbs, but some have more or less woody sts. and attain a shrub-like character and many of them are tree root-climbers. The family yields acrid and medicinal qualities, and a few species produce edible tubers and frs. Among cult. kinds are the genera Acorus, Aglaonema, Alocasia, Amorphophallus, Anthurium, Arisæma, Arum, Caladium, Calla, Colocasia, Dieffenbachia, Dracunculus, Helicodiceros, Homalomena, Hydrosme, Lysichitum, Monstera, Orontium, Peltandra, Philodendron, Pistia, Rhektophyllum, Sauromatum, Schismatoglottis, Scindapsus, Spathiphyllum, Symplocarpus, Xanthosoma, Zantedeschia.

ARACHIS. *Leguminosæ.* Peanuts are grown in gardens as a novelty and in conservatory collections of economic plants and commercially in field culture in mild long-season climates: lvs. compound: fls. papilionaceous, axillary, some of them showy: seed-pods, the peanuts, are carried beneath the ground where they mature: mostly native in Brazil, one only cult.

Since the vines are very tender to frost, the plant cannot be grown in the garden farther north than central New York, but commercially from Virginia south. If the pods are too hard, the seeds should be removed for planting. When sown under glass a medium temperature only is required. In the open the plants of the bunch type should stand 6–10 inches apart, in rows 30–36 inches apart.

hypogæa. Peanut. Goober. Groundnut. Ann. to 20 in., procumbent: lfts. 4, to 2½ in. long.

ARACHNANTHE: *Arachnis.*

ARACHNIS. *Orchidaceæ.* Epiphytes native in Asia, with fls. in panicles, the sepals and petals equal, lip shorter and 3-lobed. See *Orchids.*

Clarkei (*Arachnanthe Clarkei. Esmeralda Clarkei*). Sts. long and pendulous: lvs. to 6 in. long and 1½ in. wide: fls. about 2½ in. across, the spreading sepals and petals yellow striped transversely with brown, the lip about the same length and yellow spotted with brown, in 3–4-fld. clusters to 6 in. long, June–Aug. Himalayas.

Lowei (*Arachnanthe, Renanthera, Vandopsis* and *Vanda Lowei*). To 6 ft.: lvs. to 2½ ft. long and 2½ in. wide: fls. to 3 in. across, the lower ones orange-yellow finely spotted with red, the upper ones greenish-yellow with large brown spots, in pendulous many-fld. racemes to 5 ft. long, Aug.–Nov. Borneo.

ARAGALLUS: *Oxytropis.*

ARALIA (*Dimorphanthus*). *Araliaceæ.* Herbs, shrubs or trees with alternate pinnate lvs., small whitish fls. in umbels which form terminal panicles, and berry-like frs.; planted out-of-doors and most of them nearly or fully hardy N.

Some of the smaller native aralias are planted in borders or naturalized in woods; the larger species make bold lawn specimens and provide somewhat subtropical effects with the large leaves; some of them, as *A. spinosa*, are grown for curiosity. They thrive in rich soil. Propagated by seeds in spring, or by root-cuttings with heat.

aurea: a yellow-lvd. form, probably of *Polyscias Guilfoylei* or *P. Balfouriana.*

Balfouriana: *Polyscias Balfouriana.*

cachemirica (*A. cashmeriana*). Per. herb to 8 ft.: lvs. 1–3-pinnate, the lfts. to 3 in. long: infl. with prominent bracts to 1½ in. long. Himalayas; to be planted only far S.

californica. Per. herb to 10 ft.: lvs. 2-pinnate, the lfts. to 1 ft. long: fls. in panicles to 1½ ft. long. Ore. to Calif.

cashmeriana: *A. cachemirica.*

Chabrieri: *Elæodendron orientale.*

chinensis (*A. sinensis*). To 30 ft., somewhat spiny: lvs. 2-pinnate, the lfts. to 6 in. long and pubescent beneath: fls. in panicles to 2 ft. long. China.

cordata (*A. edulis*). Udo. Per. herb to 8 ft.: lvs. of 3–5 lfts. to 8 in. long. Japan.—In spring the young blanched shoots are eaten.

crassifolia: *Pseudopanax crassifolium.*

edulis: *A. cordata.*

elata (*A. chinensis* var. *mandshurica. A. japonica. Dimorphanthus mandshuricus*). Japanese Angelica. To 50 ft., usually prickly: lvs. 2-pinnate, the lfts. to 5 in. long, when young pubescent on veins beneath: infl. with spreading somewhat umbellate branches to 1½ ft. long. Manchuria, Korea, Japan. Var. **aureo-variegata** has lvs. variegated with yellow.

elegantissima: *Dizygotheca elegantissima.*

filicifolia: *Polyscias filicifolia.*

fruticosa: *Polyscias fruticosa.*

Guilfoylei: *Polyscias Guilfoylei.*

hispida. Bristly Sarsaparilla. Per. herb or subshrub to 3 ft., bristly: lvs. 2-pinnate, the lfts. to 3 in. long. Newf. to N. C. and Minn.

japonica: *A. elata* and *Fatsia japonica.*

Kerchoveana: *Dizygotheca Kerchoveana.*

mandshurica: *A. elata.*

Maximowiczii: *Acanthopanax ricinifolium* var.

monstrosa: *Polyscias Guilfoylei* var.

Moseri: *Fatsia japonica* var.

nudicaulis. Wild Sarsaparilla. Per. herb to 1 ft., nearly stemless: lvs. 2-pinnate, the 3–5 lfts. to 5 in. long. Newf. to Ga. and Colo.

papyrifera: *Tetrapanax papyriferum.*

pentaphylla: *Acanthopanax Sieboldianum.*

quinquefolia: *Panax quinquefolium.*

racemosa. American Spikenard. Per. broad herb to 6 ft.: lvs. very large, of 3–5 lfts. to 6 in. long: berries brown-purple. N. B. to Ga. and Mo.

Sieboldii: *Fatsia japonica.*

sinensis: *A. chinensis.*

spinosa. Devils Walking-Stick. Hercules Club. To 30 ft., very spiny: lvs. 2-pinnate, the lfts. to 3 in. long and glabrous beneath: fls. in panicles to 4 ft. long. S. N. Y. to Fla. and Tex.

trifolia: *Panax trifolium.*

Veitchii: *Dizygotheca Veitchii.*

Victoriæ: *Polyscias Guilfoylei* var.

ARALIACEÆ. Aralia or Ginseng Family. More than 50 genera, widely distributed in temp. and trop. regions of eastern and western hemispheres, herbs, shrubs and trees, often having aromatic or odoriferous foliage, with mostly alternate simple to much compound lvs., small, regular, bisexual or polygamous fls. that are individually not showy, borne in close umbels or heads, having very small calyx, usually 5 petals, 5 stamens, inferior 1- or more-celled ovary, and fr. a berry or drupe in which feature the family differs from Umbelliferæ. Many species have medicinal value, and the following genera are planted for ornament: Acanthopanax, Aralia, Dizygotheca, Echinopanax, Fatsia, Gilibertia, Hedera, Meryta, Nothopanax, Oreopanax, Panax, Polyscias, Pseudopanax, Schefflera, Stilbocarpa, Tetrapanax, Trevesia, Tupidanthus. Various plants formerly known as Aralia and Panax are now distributed in other genera. In the juvenile stage many of the woody araliads are attractive in foliage and are prized under glass, but it may be impossible to name them confidently until they arrive at flower and fruit. Those with palmately compound lvs., the petioled entire large glossy lfts. arising from the top of the petiole, are likely to be Schefflera or Tupidanthus.

ARALIA, FALSE: *Dizygotheca.*

ARAR-TREE: *Tetraclinis articulata.*

ARAUCARIA. *Pinaceæ.* Evergreen trees reaching great height, of about a dozen species in S. Amer., Australia and Pacific Isls., having scale-like or awl-like or flat stiff lvs. usually closely overlapping, and large woody cones with deciduous scales.

They are grown in warm regions and as pot-plants in juvenile forms. See *Conifers.* Specimens can be grown in the open only in the warmer parts of the country, as in Florida and California, except *A. araucana* which will stand considerably farther north.

araucana (*A. imbricata*). Monkey-Puzzle. Lvs. densely imbricated, ovate-lanceolate, 1–2 in. long, leathery, sharp-pointed. Chile.

Balansæ. Lvs. imbricated, ovate, ⅛ in. long, obtuse, dark olive-green. New Caledonia.

Bidwillii. Bunya-Bunya. Lvs. spreading in 2 rows, ovate-lanceolate, to 1½ in. long, sharp-pointed, thick and glossy. Australia.

brasiliana. Lvs. loosely imbricated, oblong-lanceolate, to 2 in. long, sharp-pointed, glaucous-green. Brazil. Var. **elegans**, branches more slender and lvs. narrower; var. **Ridolfiana**, robust form with larger lvs.

Cookii. Mature lvs. densely imbricated, ovate, obtuse, to ⅓ in. long. New Caledonia, New Hebrides.

Cunninghamii. Hoop-Pine. Lvs. needle-like, to 1½ in. long, spiny-pointed. Australia. Var. **glauca** has silvery-glaucous foliage.

excelsa. Norfolk-Island-Pine. Lvs. densely imbricated, awl-shaped, to ½ in. long, sharp-pointed. Norfolk Isl. Var. **albo-spica**, Silver-Star A., young branchlets white-tipped; var. **glauca**, lvs. bluish-green; var. **robusta**, Emerald A., lvs. deep green; var. **virgata**, secondary branchlets very short.—This species is the one usually grown by florists for pot-plants, propagated by cuttings of vigorous erect tip shoots.

imbricata: *A. araucana.*

Rulei. Lvs. densely imbricated, oblong-lanceolate to elliptic, to ¾ in. long, obtuse, silvery-gray above, glossy below. New Caledonia. Var. **Goldieana**, less branched and lvs. narrower; var. **polymorpha** is a juvenile stage.

ARAUJIA. *Asclepiadaceæ.* Woody twiners with salver- or bell-shaped fls. in axillary cymes, large leafy calyx, and long leathery pods; native in Brazil and Argentina. Grown under glass from cuttings or out-of-doors from seed sown in heat in early spring.

sericofera (*Physianthus albens*). Lvs. oblong, to 4 in. long, dark green above, white and mealy beneath: fls. white or pinkish, to 1 in. across. S. Brazil.

ARBORETUM. A growing collection of trees (Latin *arbor*, tree); in common application, a living collection of trees and shrubs, that is, of woody plants. The term ordinarily connotes a plantation of many kinds of woody plants permanently maintained for purposes of study, investigation, and education, in distinction from a grove, forest, nursery, or a parking. An arboretum may be one of the integral parts of a botanic garden.

ARBORICULTURE. The cultivation of trees; in common usage often applied to the growing of woody plants, as trees and shrubs. It implies the cultivation of the plants as individuals rather than as elements in a forest, the latter subject being silviculture and part of the larger domain of forestry. Arboriculture is to be distinguished also from the growing of trees for a particular product, as the raising of fruit which is fruit-growing or pomology. The study of trees is a large and important branch of human activity.

ARBOR-VITÆ: *Thuja.* False: *Thujopsis dolobrata.* Hiba: *Thujopsis dolobrata.*

ARBUTUS. *Ericaceæ.* Evergreen trees and shrubs native in the Medit. region and W. N. Amer., having red flaking bark, alternate lvs., red or white urn-shaped fls. in terminal panicles, and fr. a red berry-like drupe.

Arbutuses are grown out-of-doors in warm regions or under glass in the North. They do best in well-drained soil with protection from the wind. Propagated by seeds, by cuttings of half-ripened wood in the fall under glass, and also by layers, budding or veneer-grafting.

Andrachne. To 40 ft.: lvs. ovate, to 4 in. long, usually entire: fls. dull white, in panicles to 4 in. long. Medit. region.

canariensis. To 30 ft.: lvs. oblong-lanceolate, to 6 in. long, toothed, glaucous beneath: fls. greenish-white, nearly ½ in. long, in erect panicles in spring. Canary Isls.

Menziesii. Madrona. To 50 or 100 ft.: lvs. oval to oblong, to 5 in. long, entire, glaucous beneath: fls. white, ⅓ in. long, in erect panicles to 6 in. long, May–June. B. C. to Calif.

Unedo. Strawberry-Tree. To 30 ft.: lvs. oblong, to 4 in. long, toothed, shining above: fls. white or pinkish, ¼ in. long, in drooping panicles to 2 in. long, in autumn. S. Eu., Ireland; stands in Ga. Var. **integerrima** has entire lvs. Var. **rubra** (var. *Croomii*) has deep pink fls.

ARBUTUS, TRAILING: *Epigæa repens.*

ARCEUTHOBIUM: see *Loranthaceæ.*

ARCHANGELICA: *Angelica Archangelica.*

ARCHONTOPHŒNIX (*Loroma*). King Palm. *Palmaceæ.* Two or 3 tall unarmed monœcious forest feather-palms of trop. and subtrop. Australia: trunk single, ringed, the upper part represented by a smooth green sheathing column of lf.-sheaths: pinnæ many, long and narrow, entire or somewhat bifid at apex, mostly drooping or hanging and often turned edgewise: spathe-lvs. 2, formed in the sheath of lower lvs. and expanding after the lf. falls: infl. compound on a short white peduncle, the long strands at first hanging; fls. typically in 3's, the middle one small and pistillate but often bearing staminodes; staminate fls. 3-angled, with a pistillode; anthers 8–24: fr. small, red, globose or ellipsoid, ¾ in. or less diam., the exocarp or outer shell soon decaying on the ground and exposing a covering of strong fibers; seed not furrowed, the albumen strongly ruminate. King palms are grown in S. Calif., Fla., Bermuda and in American tropics. For cult. see *Palm.*

Alexandræ (*Ptychosperma Alexandræ*). To 70 or 80 ft., in native regions: trunk enlarged or bulging toward base: under surface of pinnæ prominently grayish-white, middle width of largest ones 1½–2 in. or less, side nerves very prominent: fls. white or cream-color: fr. about ½ in. long, the fibers (under shell) close and not very prominent.

Cunninghamiana (*Ptychosperma* and *Loroma Cunninghamiana. Loroma amethystina*). Piccabeen Palm. Trunk not enlarging below, unless merely at surface of ground: under surface of pinnæ green or not gray-glaucous, the side nerves not particularly prominent, width 2–4 in. at middle in the central part of lf.: fls. lilac or purplish: fr. somewhat larger, the fibers or strands strong and loose.—This palm is known to planters as *Seaforthia elegans.*

ARCTIUM. Burdock. *Compositæ.* Coarse rank-smelling biennials or short-lived perennials with large alternate lvs. and tubular florets, purple to nearly white, clustered in bur-like heads; pappus of short scales; native in Eu. and Asia, some widely distributed as weeds.

One species is grown for its edible roots and one for medicinal purposes. In Japan the roots are eaten when 2 feet long or less; the plant is treated as an annual, seeds sown in May producing edible roots by autumn and the fall-sown crop harvested in spring.

Lappa (*Lappa major. L. edulis*). Great B. Gobo of the Japanese. Stout, much branched, to 8 ft.: lvs. cordate-ovate, to 20 in. long, white-woolly beneath: heads 1½ in. across, in flat-topped clusters. Eu.; nat. in N. Amer.

minus (*Lappa minor*). Common B. Similar to *A. Lappa* but not over 6 ft. high, the lvs. smaller and heads to ¾ in. across. Eu.; nat. in N. Amer.

ARCTOSTAPHYLOS (*Uva-Ursi*). Bearberry. Manzanita. *Ericaceæ.* Evergreen shrubs and small trees with alternate usually entire lvs., small urn-shaped nodding fls. in terminal racemes or panicles, and fr. a red or brownish drupe. The trailing species are grown for ground-cover in the N. and the others in warmer regions for ornament. Cult. as for *Arbutus.*

alpina: *Arctous alpinus.*

bicolor (*Xylococcus bicolor*). To 6 ft.: lvs. oblong, to 2½ in. long, shining above, white-tomentose beneath, the margins revolute: fls. rose; ovary hairy at top. Calif., Lower Calif.

diversifolia (*Comarostaphylis diversifolia*). To 15 ft.: lvs. elliptic or oval, to 3½ in. long, tomentose beneath, the margins toothed and revolute: fls. light pink; ovary pubescent. S. Calif., Lower Calif.

glauca. Great-berried M. To 30 ft.: lvs. oval or broad-ovate, to 2 in. long, glabrous, pale green: fls. white; ovary glabrous. S. Calif., Lower Calif.

manzanita. Erect shrub to 12 ft. and sometimes much more, crooked-branched, young parts pubescent: lvs. thick, oblong, pale green, to 1½ in. long: fls. white, sometimes tinged pink, in drooping panicles. Calif.

nummularia. To 1 ft.: lvs. ovate to oblong, to ¾ in. long, glabrous: fls. white; ovary pubescent. Calif.

pungens. To 8 ft.: lvs. oblong to elliptic, to 1 in. long, becoming glabrous: ovary glabrous. Calif. to Mex.

tomentosa. Woolly M. To 18 ft.: lvs. broad-ovate to oblong, to 2 in. long, tomentose beneath: fls. white or pink; ovary tomentose. B. C. to Calif.

Uva-ursi. Bearberry. Prostrate and creeping: lvs. obovate, to 1 in. long, glabrous, the margins revolute: fls. white or pinkish. Eu., N. Asia, N. Amer.

ARCTOTIS. *Compositæ.* More or less white-woolly S. African annuals with alternate lvs. and solitary radiate heads; pappus lacking or a crown of scales; grown in the flower-garden. Propagated by seeds.

breviscapa (*A. leptorhiza* var. *breviscapa*). Stemless: lvs. oblong-lanceolate, to 6 in. long, pinnately cut, longer than scape: fls. with orange rays and dark center, the heads to 2 in. across.

calendulacea: *Cryptostemma calendulaceum.*

grandis: *A. stœchadifolia.*

Gumbletoni. St. very short: lvs. to 1 ft. long and 1½ in. wide, pinnately cut or lobed: ray-fls. deep orange-red marked at base with brown, the heads 3 in. across, on peduncles to 1 ft. high. S. Afr.

stœchadifolia (*A. grandis*). African Daisy. Bushy, to 2½ ft.: lvs. obovate, to 4 in. long, toothed: ray-fls. white or white and pale violet, in heads to 3 in. across, the stalks much longer than lvs.

ARCTOUS (*Mairania*). *Ericaceæ.* One deciduous low shrub grown for ground-cover and another species probably not cult., having alternate finely toothed lvs., urn-shaped fls. in terminal clusters, and fr. a berry-like drupe. Propagated by seeds and cuttings. It does best in shady cool locations.

alpinus (*Arctostaphylos alpina*). Black Bearberry. Lvs. obovate or oblanceolate, to 1½ in. long, turning red in autumn: fls. white tinged with pink, ⅙ in. long: fr. black. N. Eu., N. Asia, N. N. Amer.

ARDISIA. *Myrsinaceæ.* Trees and shrubs with alternate simple leathery lvs., small white or rose fls. in cymes or panicles, and berry-like frs.

Grown out-of-doors in warm climates and one a popular greenhouse subject. Propagated by seeds sown late in winter or early in spring; also by cuttings of half-matured wood over bottom heat.

crenata: *A. crispa.*

crenulata: *A. crispa.*

crispa (*A. crenulata. A. crenata*). Lvs. oblong-lanceolate, to 3 in. long, wavy-margined, pale beneath: fls. white: berries coral-red, ¼ in. across. Malaya, China.—Shrub, but grown as a pot-plant in conservatories and residences for its abundant crop of durable bright red berries.

paniculata (*A. Pickeringia. Icacorea paniculata*). Marlberry. To 20 ft.: lvs. oblanceolate, to 7 in. long, entire: fls. white: berries black and shining, ⅓ in. across. S. Fla., W. Indies, Mex.

Pickeringia: *A. paniculata.*

ARECA. *Palmaceæ.* Graceful mostly very slender-stemmed unarmed monœcious ringed feather-palms of trop. Asia and the Pacific Isls. and Australia, with spadix below the lf.-crown or in some species among the foliage, some of the species soboliferous: base of petiole widely expanded and clasping; pinnæ close together and often joined, with several prominent ribs: spadix much branched, staminate fls. occupying the terminal part of the branches or spikes, stamens 3–6; large and few pistillate fls. at the base: fr. oblong or ovoid, more or less drupe-like, 1-seeded, base inclosed in the enlarging perianth. Formerly the genus Areca was very broadly conceived, and many genera have been segregated from it. Planted in S. Fla. See *Palm.*

alba: *Dictyosperma album.*

Alicæ. Sts. clustered and rather slender, to 10 ft.: lvs. 3–6 ft. long, the pinnæ somewhat erect: spadix below the lvs.; stamens 3: fr. long-pyriform or fusiform. Australia.—Plants grown under this name may be *Arikuryroba schizophylla.*

aurea: *Dictyosperma album* var. *aureum.*

Baueri: *Rhopalostylis Baueri.*

Cathecu. Betel Palm. Very slender palm with solitary trunk to 100 ft. and 6 in. diam., leafless below the relatively small crown: lvs. 3–6 ft. long, with many broad rather soft pinnæ not taper-pointed and irregularly notched or erose at apex and the upper ones confluent: fr. ovoid to globular-ovoid, mostly 2 in. or less long, orange or scarlet, with soft fibrous covering. Probably Malaya; cult. in India and elsewhere for the nut which is chewed along with the lf. of betel pepper. Lvs. sometimes variegated. Fls. fragrant. The name is commonly spelled Catechu but it was not so written by Linnæus, author of the name, in the three editions of Species Plantarum.

crinita: *Acanthophœnix crinita.*

glandiformis. Tall and slender, with marked rings: lvs. to 8 ft. long; pinnæ long-pointed, the midrib prominent underneath and secondary nerves more or less marked: spadix short, branched near base into branches 1 ft. or so long; pistillate fls. aggregated at base of branches, perianth enlarging. Moluccas.

Ilsemannii. Hort. name for a palm from the Pacific Isls., perhaps not an Areca: sts. red: young lvs. dark red, becoming green.

lutescens: *Chrysalidocarpus lutescens.*

Normanbyi: *Normanbya Normanbyi.*

rubra: *Dictyosperma album* var. *rubrum; Acanthophœnix rubra.*

sapida: *Rhopalostylis sapida.*

singaporensis: probably *Ptychoraphis singaporensis.*

speciosa: *Hyophorbe amaricaulis.*

triandra. Very attractive soft-lvd. palm making several green strongly ringed slender leafy sts. 5–10 ft.: lvs. bright green, 3–5 ft. long, with decurved broad pinnæ toothed or shallowly cut-lobed at the apex, the terminal pinnæ confluent or deeply 2-lobed: fr. oblong or long olive-like, red or orange-scarlet at maturity. India, Malaya.

Verschaffelti: *Hyophorbe Verschaffelti.*

ARECA, SPINE-: *Acanthophœnix.*

ARECASTRUM. *Palmaceæ.* Segregate from Cocos, considered as a single polymorphous species; native from Bahia in Brazil to Uruguay, Argentina, Paraguay and Bolivia. Unarmed monœcious feather-lvd. tree with solitary ringed trunk; spadix from axils of lower lvs., the staminate fls., with 6 stamens, on upper part of the branches and pistillate on lower part; spathe strongly plicate-sulcate, or grooved, on outside; pistillate fls. ovate when closed, the petals valvate at apex: fr. variable, 1 or 2 in. long, globose, ovate, elliptic or obovate; nutlet with thick bony wall; albumen of seed solid and not ruminate. In cultivation the trees vary widely in stature and habit, but these differences may not be botanically significant any more than comparable divergencies in apple trees, American elms and coconuts. See *Palm.*

Romanzoffianum (*Cocos Romanzoffiana. C. plumosa*). Queen Palm. Medium-sized tree to 30 ft. or more, the trunk smooth and plainly ringed, usually carrying a few dead hanging lvs. and old bases under the graceful crown: lvs. 8–15 ft. long, decurved, many or most of the mature pinnæ (which are soft in texture) making a characteristic bend or knuckle beyond or near the middle at the point where they begin to droop; pinnæ many, green both sides, mostly not exceeding 1 in. broad and most of them narrower, long-pointed, with faint side nerves: spathe 2–3 ft. or more long; branches of big spadix drooping: fr. globose to globose-ovate, about 1 in. lengthwise (to 1¼ in.) and nearly or quite as long as broad, borne in a heavy hanging truss. Cent. and S. Brazil. Var. australe (*Cocos australis* of botanists, not hort. *C. Arechavaletana. C. Datil. C. flexuosa* of hort.). Fr. ovate-elliptic, the breadth distinctly less than the length and sometimes only about half as much: considered to be a more slender and graceful tree than the species and with rather smaller crown, but this is to be confirmed; this var. appears to be the prevailing form of the tree commonly planted in S. Calif., Fla. and elsewhere as *Cocos plumosa.* S. Brazil, Uruguay, Paraguay, Argentina. Var. **botryophorum** (*Cocos botryophora*). Very tall robust tree with heavy upright crown: fr. large, globose-ovate or -obovate, 1½–2 in. long. Brazil.

AREGELIA. *Bromeliaceæ.* Epiphytic herbs with prickly-toothed lvs. in a basal rosette and white, violet or blue fls. in simple dense heads among the lvs.; sometimes grown under glass. For cult. see *Bromelia.*

tristis. Lvs. to 1 ft. long and 6 in. wide, mottled with brown: fls. purple. Brazil.

ARENARIA. Sandwort. *Caryophyllaceæ.* Low herbaceous annuals and perennials, often forming mats, suitable for borders, carpets, rock- and alpine-gardens, walls and lawn clumps: spring or summer-blooming; fls. usually white, small, terminal or clustered, sometimes axillary: lvs. entire, narrow and opposite: native around the world but rare in the tropics. Includes plants listed as *Alsine.*

A few of the kinds entered here are listed in the trade also as Alsine, and a troublesome question of nomenclature is involved. For our purposes, however, they are retained in Arenaria. Usually only the perennial species are cultivated and these require no special soil or treatment unless they are alpines. Propagated by division and by seeds, the rare species sometimes by cuttings.

balearica. Corsican S. To 3 in., creeping: lvs. ovate, glossy, thick and ciliated: fls. white, solitary. Balearic Isls., Corsica; not hardy north of N. Y. City.

banatica. To 8 in. or less: lvs. ciliate: fls. white with white sepals striped green, in 3–5-fld. clusters. S. E. Eu.

Bauhinorum. Tufted, to 8 in.: lvs. very narrow: fls. white, large. Eu.—Botanical position uncertain; sometimes referred to *A. liniflora* but this is also a dubious species.

cæspitosa: *A. verna* var.

cephalotes. Sts. erect: lvs. filiform, ciliate: fls. in a compact thyrse. S. Russia.

cuspidata: listed name.

gracilis. Slightly tufted sticky-pubescent per. to 4 in.: lvs. linear: fls. white, in 2's. S. E. Eu.

graminifolia. To 1½ ft.: lvs. long and thread-like: fls. white, in 3-forked loose panicles. Eu.

grandiflora. To 10 in. or less: lvs. flat awl-shaped, ciliate: fls. white, large, solitary or in 2's or 3's. Eu.—Runs into many forms.

grœnlandica. Ann., very low, forming mats, the decumbent or erect sts. bearing 1–5 white fls.: lvs. small and narrow. Greenland and Lab. to mts. of N. C.

Hookeri. Tufted per. to 6 in.: lvs. subulate: fls. white, in dense cymes. Mont. to Colo.

juniperina. Tufted, to 6 in.: lvs. awl-like: fls. white, in clusters. E. Eu., Asia Minor.

laricifolia. To 8 in.: lvs. awl-shaped, ciliate: fls. large, white, hairy, solitary or clustered. Switzerland.

Ledebouriana. Alpine per., cespitose, glabrous, dichotomous, branches to 6 in. long: lvs. rigid, narrow-awl-shaped and crowded: fls. on stiffish slender pedicels. S. E. Eu.

liniflora: see *A. Bauhinorum.*

longifolia. Sts. erect, to 1 ft.: lvs. awl-shaped, thread-like: fls. white, in 3-forked panicles. Siberia.

montana. To 4 in.: lvs. narrow: fls. white, large, solitary. S. W. Eu.

peploides. Branches procumbent, fleshy, to 4 in.: lvs. ovate, light green, fleshy: fls. white. Seashores of Britain.

pinifolia. Dwarf cespitose per., with ascending parts: lvs. narrow-awl-shaped or bristle-like: fls. white, in small corymbs. Asia Minor.

pungens. Forming bristly tufts to 8 in. and more high: lvs. thorny, very narrow: fls. white, solitary, terminal or in axils near tip of branches. Spain.

purpurascens. Decumbent, tufted, to 4 in.: lvs. ovate-lanceolate: fls. rose-lilac, 2–3. Pyrenees.

racemosa. Somewhat woody per. to 3 in. high, making mats: lvs. awl-shaped, curved: fls. white, solitary. Spain.

Rosani. To 2 in. with erect coarsely hairy sts.: lvs. narrow, hairy: fls. white, in 3's. Italy.

rotundifolia. Spreading tufted branches to 6 in.: lvs. roundish, ciliate, ¼ in. across: fls. white, solitary. Siberia.

Saxifraga. Alpine cespitose per., glandular-hirsute: lvs. in rosettes, linear-lanceolate, about ½ in. long, acute, 5–7-nerved: fls. 2–7 in a cluster. S. E. Eu., Asia Minor.

tmolea. Tufted, st. very short: lvs. ovate-oblong, to ⅛ in. long: fls. white, in clusters of 1–3. Asia Minor (Mt. Tmolus, etc.).

verna. To 3 in.: lvs. flat, narrow: fls. white, on thread-like sts. Eu. and Rocky Mts. Var. **cæspitosa** is a compact leafy form making dense moss-like masses.

ARENGA. *Palmaceæ.* Monœcious feather-palms (lvs. sometimes pinnatisect) of trop. Asia and Malaya, unarmed except for needles in the heavy lf.-sheath fibers in some species, flowering from the upper lf.-axils downwards, in some kinds the tree dying when the last spadix has fruited: trunk solitary or several:

pinnæ or parts with many strong nerves beside the midrib, whitish or gray underneath, jagged, notched or cut off at apex which is sometimes broadened, and often notched on sides: spadix much branched, peduncle short, branches drooping; sexes usually separate on different spadices but sometimes a pistillate between two staminates; stamens many: fr. more or less drupe-like, obovoid to globose, 2–3-seeded. See *Palm.*

Ambong (*A. mindorensis. A. tremula*). Trunk short and thick, but plant becoming a tree: lvs. very large, the blade to 10 ft. long and petiole to 6 ft.; pinnæ to 2 ft. and more long, somewhat paper-like, with several deep indentations or constrictions on either side: fr. globular, about 1 in. diam. Philippines.

Engleri. Handsome, dwarf, perhaps to 10 ft.: lvs. gray-tomentose or -pubescent underneath, with many pinnæ that are narrow at the base of the lf. and broad towards its top, the sides and apex variously notched and jagged: spadix short: fr. about 1 in. or less across, subglobose, 3-seeded. Formosa; stands outdoors in S. Calif.

mindorensis: *A. Ambong.*

saccharifera. Sugar Palm. Monocarpic large palm, dying when the last spadices have ripened their fr.: trunk solitary, to 40 ft.: lvs. to 20 ft. and more long, whitened beneath; pinnæ to 100 or more on either side, single and fascicled, variously dentate or notched or 2-lobed at apex: fr. oblong-turbinate, about 2 in. long or somewhat more, flat or depressed on top, borne on very long spadices. Malaya.—Cult. in India for sugar made from the sap and for other uses; planted in S. Fla.

tremula: *A. Ambong.*

ARETHUSA. *Orchidaceæ.* Low terrestrial orchids, one native in bogs in E. N. Amer. and sometimes planted in cool moist protected places. **A. bulbosa.** To 10 in., with small bulbs: lf. solitary, linear, to 6 in. long: fls. solitary or rarely 2, rose-purple, 2 in. long; lip drooping, fringed or toothed, spotted with purple.

ARGANIA. *Sapotaceæ.* One hard-wooded evergreen tree to 20 ft., often with spiny branches, native in Morocco. **A. Sideroxylon.** Lvs. lanceolate-spatulate, entire, glabrous: fls. greenish-yellow, 5-parted, in clusters: fr. an oblong berry, the seeds yielding oil.—May be planted in S. Calif. Propagated by layers and cuttings.

ARGEMONE. Prickly-Poppy. *Papaveraceæ.* American prickly herbs (1 shrubby, not in cult.) with yellow juice, pinnatifid spine-tipped lvs., and large terminal fls., sepals often horn-tipped; grown as annuals in the flower-garden. They thrive in any good soil and sunny exposure.

alba. To 3 ft. and more, with pale or glaucous foliage: fls. large, white, the sepals with only slight tips: caps. somewhat hispid. Southern states.

grandiflora. To 3 ft.: lvs. white-veined: fls. white, 2 in. across, the sepals with stout long tips: caps. not prickly or only slightly so. Mex. Var. **lutea** has yellow fls.

hispida: *A. platyceras* var.

mexicana. To 3 ft.: lvs. white-veined, glaucous: fls. yellow or orange, 2 in. across: caps. prickly. Trop. Amer.

platyceras. Crested P. To 4 ft.: lvs. somewhat glaucous: fls. white or rarely purple, 2 in. across, closely subtended by bract-like lvs.: caps. very spiny. N. and S. Amer.—Apparently most common garden kind. Var. **hispida** (*A. hispida*), Hedgehog P., is densely bristly as well as having yellow spines. Var. **rosea** has brownish-purple fls.

ARGENTINA: *Potentilla Anserina.*

ARGYREIA. *Convolvulaceæ.* Asiatic twining (seldom nearly erect) pubescent or tomentose shrubs or per. herbs with alternate simple lvs. and showy purple or rose funnelform fls.; grown under glass, and in the open far S. Propagated by seeds and cuttings over heat.

speciosa. Woolly Morning-Glory. Large climber: lvs. to 1 ft. across, ovate-cordate, white-tomentose underneath: fls. rose, 2–3 in. long, on stalks to 6 in. long. India, Java, China.

splendens. Silver Morning-Glory. Tall climber: lvs. to 7 in. long and 4 in. across, elliptic with angular or rounded never cordate base, white-silky-hairy underneath: fls. rose, 1½ in. long, on stalks 1–4 in. long. India.

ARIDARIA. *Aizoaceæ.* Segregate from Mesembryanthemum, differing in technical characters: corolla showy, ¾–1½ in. or more across: seeds compressed and tuberculate. S. Afr., in dry habitats. For cult. see *Mesembryanthemum.*

splendens (*M. splendens*). Somewhat woody per., branched, erect: lvs. half-cylindric, glaucous, to 1 in. long, crowded: fls. white, on short thickened peduncle, the petals dentate.

ARIKURYROBA. Arikury Palm. *Palmaceæ.* One small graceful monœcious feather-palm of trop. Brazil, unarmed except for the strongly spined petioles, differing from Cocos (from which it is a segregate) in the small ovate pistillate fls. with valvate petals and plicate-sulcate spathe as well as in habit and much smaller fr. which has a solid and ruminate albumen; nutlet with thin fragile wall. **A. schizophylla** (*Cocos schizophylla. Arikury schizophylla. Arikuryroba Capanemæ*). Trunk 2–8 ft., solitary, covered for the most part with lf.-bases: pinnæ green both sides with strong midrib and faint side nerves, about 1 in. broad, notched or cut at apex: spadices in the axils of lower lvs., long-peduncled and becoming declined; staminate fls. on upper part of branches: fr. ellipsoid, 1 in. or more long, in a grape-like cluster. Probably adapted to S. Fla. *Butia Bonneti* has apparently been confused with this palm. See also *Areca Alicæ.* Not well understood.

ARIL: an appendage or an outer covering of a seed, inside the pericarp, growing out from the hilum or funiculus; sometimes it appears as a pulpy covering.

ARIOCARPUS (*Anhalonium*). *Cactaceæ.* Spineless or nearly so, making a small nearly globular or top-shaped body of which the larger part is in the ground, with spirally arranged leaf-like thick tubercles: fls. diurnal, opening wide, from axillary areoles located between the tubercles, the areoles on the apex of the tubercles being barren. One species now recognized (see *Roseocactus*). See *Cacti.* **A. retusus** (*A. furfurascens. A. prismaticus. A. trigonus*). Seven Stars. Body globular or flattish, woolly in center, about 4 in. across; tubercles not grooved on upper side: fls. nearly or quite white, to 2 in. or more long. Mex.

ARISÆMA. *Araceæ.* Widely distributed herbs mostly with tuberous roots, palmately compound or dissected lvs., and unisexual fls. borne on a spadix which is surrounded by the tubular spathe, the limb often arching above.

A few species are sometimes transplanted from the wild into moist shady places. Propagated by tubers and seeds.

Dracontium. Dragon-Root. To 4 ft.: lvs. pedately 5–17-parted into lfts. to 10 in. long and 4 in. wide: spathe greenish, the tail-like spadix projecting: berries reddish-orange. Me. to Fla. and Tex.

japonicum: *A. serratum* var. *Blumei.*

serratum. Lvs. pedately 5–11-parted into slender-pointed more or less serrate lfts. to 6 in. long and 2 in. wide: spathes green or purplish, on stalks to 20 in. high. Japan. Var. **Blumei** (*A. japonicum*) has entire lfts. and pale spathes.

triphyllum. Jack-in-the-Pulpit. Indian Turnip. To 3 ft.: lvs. of 3 ovate or oblong-ovate lfts. to 7 in. long and 3½ in. wide: spathes green striped with purple, arched in a broad flap over the spadix: berries red. E. N. Amer.

ARISTEA. *Iridaceæ.* African herbs with lvs. in basal rosette and blue fls. in spikes, racemes or corymbs, the perianth-tube short and segms. twisting up spirally after flowering; grown under glass or in the open in Calif. Propagated by seeds and division.

capitata. To 4 ft.: lvs. to 4 ft. long and ½ in. wide, rigid: fls. ½ in. long, in long narrow panicles. S. Afr.

Eckloni. To 1 ft. or more: lvs. to 1½ ft. long and ½ in. wide: fls. ⅓ in. long, in loose panicles. S. Afr.

ARISTOLOCHIA. Birthwort. *Aristolochiaceæ.* Per. herbs and shrubs, mostly climbers, with usually heart-shaped entire lvs., bent odd-shaped very irregular tubular calyx simulating a corolla, often constricted at the mouth and sometimes tailed, and fr. a caps.; native in warm and temp. regions, and grown as porch vines or in the greenhouse, and a few of them as erect garden herbs.

The tender kinds do best in a greenhouse border of rich soil. Propagated by cuttings of ripened wood over heat, layers, and seeds. *A. durior*, hardy North, is a rapid grower and makes good screens for porches and for covering buildings.

brasiliensis. Climbing: fls. dingy-yellow veined with purple, with 2 very unequal lips, the upper narrow and to 4 in. long, the lower to 4 in. long and 7 in. across. Brazil. Var. **macrophylla** has large lvs.

californica. Climbing to 12 ft., woody, deciduous: fls. greenish-purple, with strongly bent tube about 1½ in. long, and 2-lipped limb, the upper lip 2-lobed. Calif.

Clematitis. Erect, to 2 ft., herbaceous: fls. yellowish-green, to 1½ in. long, with straight tube, in axillary clusters. Eu.; nat. in E. U. S.

durior (*A. macrophylla. A. Sipho*). Dutchmans-Pipe. Woody, climbing to 30 ft.: fls. yellowish-green, with curved U-shaped tube to 3 in. long and 3-lobed brownish-purple limb to 1 in. across. Pa. to Ga. and Kans.

elegans. Calico-Flower. Slender woody climber with drooping branches: fls. with yellowish-green inflated tube to 1½ in. long and nearly circular entire limb to 3 in. across, white veined purple outside, purple-brown inside. Brazil.

fimbriata. Sts. scarcely climbing: fls. with green strongly curved tube inflated at base and one-sided cordate limb to 1 in. across, greenish-brown outside, purple-brown inside veined with yellow, edged with long hairs. Argentina.

galeata. Climber: fls. with curved tube inflated below, to 3 in. long, and 2-lobed dark purple lip, the upper to 3 in. long and lower to 5 in. long which is clawed and expanding into broad blade purple outside and whitish inside. Brazil.

Galeotti. Herbaceous climber: fls. brown, with straight tube inflated below and broad-lanceolate limb barbed within. Mex.

gigantea: *A. grandiflora* var. *Hookeri.*

gigas: *A. grandiflora.*

grandiflora (*A. gigas*). Pelican-Flower. Climbing, woody: fls. with yellowish-green inflated tube and cordate-ovate wavy limb 6 in. and more across, veined and spotted purple, with long tail. Jamaica. Var. **Hookeri** (*A. gigantea*), fls. with short tails. Var. **Sturtevanti**, fls. very large with tails to 3 ft. long.

hastata. Erect herb to 3 ft.: lvs. narrow-lanceolate or linear, hastate or sagittate: fl. S-shaped, greenish, near the ground. S. U. S.

kewensis. Hybrid between *A. trilobata* and *A. brasiliensis*, the former a vine in trop. Amer. with greenish-yellow large fls.

macrophylla: *A. durior.*

macroura. Herbaceous climber: fls. brownish-green, with strongly curved tube inflated below and broad-cordate dark brown lip with slender twisted tail to 1½ ft. long. Brazil.

odoratissima. Sweet-scented climber: fls. purple, with inflated tube about 1 in. long and cordate-oblong limb to 3 in. long. Jamaica, Cent. Amer.

Serpentaria. Virginia Snakeroot. Erect, to 3 ft., herbaceous: fls. about 1 in. long, greenish, with curved tube and short slightly lobed limb. Conn. to La.

Sipho: *A. durior.*

Sturtevanti: *A. grandiflora* var.

tomentosa. Climbing to 30 ft., woody: fls. about 1½ in. long, with greenish-yellow U-shaped tube and yellow reflexed 3-lobed limb ¾ in. across. N. C. to Fla. and Mo.

triangularis. Herbaceous climber with triangular lvs.: fls. bright purple, spotted and veined, about 1 in. long, with curved tube inflated below and broad-ovate emarginate lip. Brazil.

ARISTOLOCHIACEÆ. Birthwort Family. Five genera mostly of warm regions, herbs or shrubs with alternate lvs., bisexual fls. with corolla-like 3-lobed calyx of various forms and colors, 6–36 stamens, mostly inferior 4–6-celled ovary, and capsular frs. Aristolochia and Asarum are known to hort.

ARISTOTELIA. *Elæocarpaceæ.* Evergreen trees or shrubs native in the southern hemisphere, with simple lvs. opposite or nearly so, small unisexual fls. and fr. a berry; planted in S. Calif. for ornament. Propagated by cuttings of ripe wood under glass.

Colensoi. Similar to *A. racemosa* but smaller with quite glabrous lvs., simple racemes and smaller berries. New Zeal.

fruticosa. Shrub to 8 ft., much branched: lvs. leathery, obovate, to 1 in. long, entire or lobed or on young plants pinnatifid: fls. solitary or in 3–6-fld. cymes. New Zeal.

Macqui. Shrub to 7 ft.: lvs. oblong, about 3 in. long, toothed, shining and sometimes variegated: fls. greenish. Chile.

racemosa. New Zealand Wineberry. Tree to 25 ft.: lvs. ovate, to 5 in. long, deeply sharp-toothed: fls. rose, in many-fld. panicles: berry dark red or nearly black, size of pea. New Zeal.

ARMED: provided with any kind of strong and sharp members, as if for defense, as of thorns, spines, prickles, barbs.

ARMERIA: *Statice.*

ARMORACIA. *Cruciferæ.* A few per. herbs in Eu. and Asia, one widely grown in the vegetable-garden and also run wild in N. Amer.; one native species in N. Amer. is considered by some to be referable to this genus: radical lvs. large and often dock-like, variously dissected: fls. white, small: fr. an ovoid or short-oblong pod or silicle. **A. rusticana** (*Nasturtium, Radicula* and *Roripa Armoracia*), Horse-Radish (which see), is a deep-rooted glabrous strong per.: lower lf.-blades to 15 in. long and 9 in. across, crenate-dentate or jagged and sometimes dissected into linear segms., upper st.-lvs. lanceolate to oblong: fls. in spring in a terminal panicle: seedless. S. E. Eu.

ARNEBIA. *Boraginaceæ.* Old World herbs with alternate simple lvs. and yellow or violet slender-tubed fls. in racemes or cymes, throat without scales; sometimes grown in the border or rock-garden. Of easy cult. Propagated by seeds, division or cuttings.

cornuta. Arabian-Primrose. Ann. to 2 ft.: lvs. lanceolate: fls. yellow spotted with black, changing to maroon, ¾ in. across. Orient.

echioides. Prophet-Flower. Per. to 1 ft.: lvs. obovate-oblong: fls. yellow with purple spots, changing to pure yellow. Armenia.

ARNICA. *Compositæ.* Herbaceous perennials with clustered root-lvs. and opposite st.-lvs. and large long-stalked heads of yellow ray- and disk-fls.; pappus of bristles; native in Eu., Asia and N. Amer.

Arnicas are grown in the rock-garden or border or colonized in woodsy places. Tincture of *A. montana* has medicinal uses. Propagated usually by division, seldom by seeds.

alpina. To 15 in., pubescent: lvs. lanceolate or spatulate, to 4 in. long, nearly entire: heads about 2 in. across, usually solitary; pappus white. N. N. Amer., N. Eu.

Chamissonis. To 2 ft., soft-pubescent: lvs. oblong-lanceolate, to 6 in. long, toothed or entire: heads to 2 in. across, corymbose; pappus white or yellowish. B. C. to Mont.

Clusii: *Doronicum Clusii.*

longifolia. To 2 ft., pubescent: lvs. linear-lanceolate, to 6 in. long, entire or toothed: heads in flat-topped panicles; pappus brownish, plumose. Wash. to Mont. and Calif.

mollis. To 2 ft., pubescent: lvs. oblong-lanceolate, to 6 in. long, toothed: heads 1–3; pappus brownish, plumose. B. C. to Colo.

montana. To 2 ft.: radical lvs. oblong-lanceolate, glabrous, entire: heads to 3 in. across, 3–4 in a cluster; pappus white. Eu.

nevadensis. To 1 ft., pubescent: lvs. orbicular or ovate, to 2¼ in. long, usually entire: heads ½ in. long. Calif.

sachalinensis. To 2 ft., nearly glabrous: lvs. oblong-lanceolate, toothed: heads few. Sachalin Isl.

AROIDEÆ, AROIDS: *Araceæ.*

AROMA: *Cailliea glomerata.*

ARONIA. Chokeberry. *Rosaceæ.* N. American deciduous shrubs with alternate toothed lvs., white or pinkish fls. in terminal corymbs in early spring, and fr. a small berry-like pome.

Propagated by seeds sown when ripe or stratified and by suckers, layers and cuttings of green wood under glass. Useful for colonizing in low places, showy in bloom; fruit attractive in autumn.

arbutifolia (*Pyrus arbutifolia*). Red C. To 10 ft.: lvs. gray-tomentose beneath: fr. red. Mass. to Fla. and Tex. Var. **brilliantissima** is advertised.

atropurpurea (*A. floribunda. Pyrus arbutifolia* var. *atropurpurea*). Purple C. To 12 ft.: lvs. pubescent beneath: fr. purple-black. Newf. to Fla. and Ind.

floribunda: *A. atropurpurea.*

melanocarpa (*A. nigra. Pyrus melanocarpa* and *P. nigra*). Black C. To 4 ft.: lvs. nearly glabrous beneath: fr. black. N. S. to Fla. and Mich. Var. **grandifolia** grows to 10 ft. and has larger lvs. and frs.

nigra: *A. melanocarpa*

ARPOPHYLLUM. *Orchidaceæ.* Trop. American epiphytes with pseudobulbs bearing solitary lvs. and red fls. in thick racemes, the sepals and petals similar, the lip concave and slightly 3-lobed; do best in a temperate greenhouse. See *Orchids* for cult.

giganteum. To 2 ft.: pseudobulbs to 8 in. high: lvs. linear, to 1 ft. long: fls. small, light rosy-red with somewhat darker lip, in stiffly erect racemes to 1 ft. high, Apr.–June. Mex., Guatemala.

ARRACACIA. *Umbelliferæ.* Stout per. herbs native from Mex. to Peru, with pinnately compound lvs., small white or dark purple fls. in compound umbels, and compressed frs.

One species is grown in the mountains of the tropics for the thick edible roots. Propagated by the small heads which form at the bases of the leaf-stalks.

esculenta: *A. xanthorrhiza.*

xanthorrhiza (*A. esculenta*). Apio. Roots branching, with starchy yellow flesh: lvs. ternate or 2-pinnate. Colombia.

ARRHENATHERUM. *Gramineæ.* Tall per. grasses resembling oats, the spikelets in panicles, florets awned; native in Medit. region, nat. in N. Amer.; sometimes sown as a meadow grass. See *Grasses.*

bulbosum: *A. elatius* var. *tuberosum.*

elatius (*Avena elatior*). Tall Oat-Grass. To 4 ft., tufted: lvs. to 1 ft. long and ¼ in. wide, rough: panicles 1 ft. or more long, shining, light green or purplish, the branches erect. Nat. in N. Amer. Var. **tuberosum** (*A. bulbosum*) has a string of tubers at the ground; often with striped lvs.

[**ARROWHEAD:** *Sagittaria.*

ARROWROOT: *Maranta arundinacea.*

ARROW-WOOD: *Viburnum dentatum.*]

ARSENOCOCCUS: *Lyonia ligustrina.*

ARTABOTRYS. Tail-Grape. *Annonaceæ.* Trop. climbing evergreen shrubs with alternate simple lvs., hooked peduncles adapted to climbing, fls. constricted above the closely packed stamens, and fr. of separate carpels borne in clusters on the hardened receptacle; one species is grown in greenhouses or the open far S. It requires fertile soil. Propagated by seeds.

odoratissimus. Climbing Ylang-Ylang. Lvs. oblong, to 6 in. long: fls. very fragrant, greenish or yellowish, to 2 in. long: carpels yellow, smooth, 1 in. or more long. Old World tropics.

ARTEMISIA. Wormwood. *Compositæ.* Aromatic and bitter herbs or small shrubs with alternate mostly dissected lvs. and small numerous yellow or white heads; fls. all tubular; pappus none. They are per. unless otherwise noted.

Wormwoods are grown for ornament but mostly for the medicinal and aromatic qualities. They thrive even in poor dry soil. Usually increased by division; also by seed when obtainable.

Abrotanum. Southernwood. Old Man. Glabrous green subshrub to 5 ft.: lvs. 1–3-pinnately divided into thread-like segms.: heads yellowish-white, ⅛ in. across, in a loose panicle. Eu.

Absinthium. Common W. Absinthium. Subshrub to 4 ft., white-silky: lvs. 2–3-parted into oblong segms.: heads yellowish, ⅛ in. across, in many-fld. leafy panicles. Eu.

albula. White-tomentose, to 3½ ft., with slender spreading branches: lower lvs. ovate, to 2 in. long, with 3–5 short broad lobes, upper lvs. linear or nearly so: heads small and numerous in little racemes terminating the branches. Tex., Colo., S. Calif.—Hardy N. and sometimes grown as "Silver King Artemisia"

annua. Sweet W. Ann. to 5 ft., glabrous, very sweet-scented: lvs. 2–3-pinnate, the segms. deeply cut: heads yellow, 1/12 in. across, in a loose many-fld. panicle. Asia; nat. in N. Amer.

arborescens. Shrubby, to 2 ft.: lvs. finely divided, silvery: heads bright yellow, in one-sided racemes. Medit. region.

arbuscula. Low Sage-Brush. Shrub to 1 ft., silvery-pubescent: lvs. wedge-shaped, 3-lobed, to ½ in. long: heads brownish, in simple panicles, often spike-like. Wash. to Calif. and Wyo.

argentea. Shrubby, to 2 ft., white-silky: lvs. 2-pinnate into linear or lanceolate segms.: heads woolly, nodding, in raceme-like panicles. Madeira.

Baumgarteni. To 1 ft., silvery-pubescent: lvs. 3-pinnatifid: heads yellow, racemose. Alps.

campestris. To 2 ft., shrubby, glabrous or becoming so: lvs. pinnatifid into linear segms.: heads yellow, minute, racemose. Eu., Asia.

camphorata. Shrubby, to 2½ ft., camphor-scented: lvs. 2–3-pinnate into thread-like segms., glabrous: heads yellow, nodding, silvery-pubescent, in panicles. S. Eu.

canadensis. Nearly or quite glabrous per. to 2 ft.: lvs. mostly 2-pinnate, with very slender segms.: heads greenish, small, in long narrow panicle. Newf. to New England and far west, Eu.

canescens: hort. name.

diversifolia. White-tomentose, st. simple, to 4 ft. or more: lower lvs. to 4 in. long, mostly pinnately cut into narrow acute lobes, upper ones linear-lanceolate: fls. in a narrow panicle. Neb. to Calif. and north.

Dracunculus. Tarragon. Estragon. Per. to 2 ft., glabrous, green: basal lvs. 3-parted at tip; st.-lvs. linear or lanceolate, entire or small-toothed: heads whitish-green, to ⅛ in. across, in spreading panicles. Eu.—The lvs. are used as seasoning.

frigida. Fringed W. Per. to 1½ ft., silvery-pubescent: lvs. 2-pinnate into linear segms.: heads yellow, nodding, in racemes. W. N. Amer., Asia.

glacialis. Per. to 4 in., gray-pubescent: lvs. pinnatisect: heads golden-yellow, in corymbs. Alps.

gnaphalodes. White-tomentose per. to 3 ft. or more: lvs. simple, oblanceolate and somewhat serrate, the upper ones linear and entire: heads many in leafy panicles, small, grayish. N. U. S. and Canada.

gracilis: *A. scoparia.*

lactiflora. White Mugwort. To 4 ft., nearly glabrous: lvs. pinnately parted or cut into large toothed or incised segms., pale beneath: heads white, about 1/16 in. across, loosely panicled. China.—Much like *A. vulgaris.*

longifolia. White-tomentose per. to 3 ft. or so: lvs. linear or linear-lanceolate, simple and entire: heads erect, in narrow panicle. Neb. northwest.

maritima. To 2 ft., much branched, silvery-pubescent: lvs. 2-pinnate into linear segms.: heads brownish-yellow, in erect or drooping oblong racemes. Eu.

montana: a listed name, botanical position uncertain.

Moxa. Shrubby, gray-pubescent: lvs. 2-pinnate into linear-lanceolate segms.: heads ⅙ in. across, nodding, in panicles. China.

mutellina. To 6 in.: lvs. pinnatisect into linear-lanceolate segms., silvery-pubescent: heads yellowish-green, in racemes. Alps.

pedemontana. Small silvery-woolly per. to 6 in.: lvs. more or less rounded in outline, cut into linear divisions: fls. pale yellow, few toward top of st., sometimes not produced. Alps, S. Eu.—See *A. pontica.*

persica. Per. or bien. to 4 ft., white-tomentose: lvs. pinnatisect: heads yellow, ⅙ in. across, in racemes. W. Asia.

pontica. Roman W. To 4 ft., shrubby: lvs. hoary below, pinnately cut into linear segms.: heads whitish-yellow, ⅛ in. across, nodding in long open panicles. Eu.—Often remains sterile, forming patches of low feathery shoots; has been planted as *A. pedemontana.*

Purshiana. Cudweed W. To 2 ft.: lvs. ovate to lanceolate, mostly entire, white-woolly on both sides: heads white, in spike-like panicles. B. C. to Calif. and Neb.

rupestris. To 6 in.: lvs. somewhat silky, 2-pinnatisect into linear segms.: heads yellow, nodding, in panicles. Eu.

sacrorum. Russian W. Ann. or bien., shrubby below: lvs. hoary or white-pubescent, sinuately cut: heads nodding, in slender racemes. Russia, Siberia. Var. viride. Summer-Fir. Pyramidal, to 10 ft., with rich green much dissected foliage.

scoparia (*A. gracilis*). Ann., slender, to 5 ft.: lvs. much divided into hair-like segms.: heads small, white, in broad densely packed panicles. E. Eu.

serrata. Per. to 10 ft., much branched: lvs. lanceolate, to 6 in. long, serrate, white-woolly beneath: heads greenish, 1/12 in. across, in panicles. Ill. to S. D.

spicata. To 6 in.: lvs. pinnatisect, silvery-pubescent: heads yellow, in spikes. Alps.

Stelleriana. Beach W. Old Woman. Dusty Miller. Per. to 2½ ft., densely white-woolly: lvs. pinnatisect into oblong entire or toothed lobes: heads ¼ in. across, yellow, in compact many-fld. racemes. Coasts, N. E. Asia, Que. to Del.

tridentata. Sage-Brush. Shrub to 12 ft., silvery-pubescent: lvs. wedge-shaped, to 1 in. long, 3–6-toothed or lobed, tips blunt: heads ⅛ in. across, many, in panicles. B. C. to Calif. and Neb.

vulgaris. Mugwort. Per. to 3½ ft., much branched, sts. often purplish: lvs. pinnatifid into oblong toothed or entire segms., fragrant, white-tomentose beneath, dark green above: heads yellow, ⅛ in. across, in panicled spikes. Eu., Asia; nat. in E. N. Amer.

ARTHROPODIUM. *Liliaceæ.* Tufted per. herbs with fleshy roots, mostly basal lvs., and white or purplish fls. in racemes or panicles, the perianth-segms. distinct; grown in S. Calif. and cult. as for *Anthericum.*

candidum. To 14 in.: lvs. to 10 in. long and ¼ in. wide, grassy: fls. white, ¼ in. across, in simple racemes. New Zeal.

cirrhatum. To 3 ft.: lvs. to 2 ft. long and 2½ in. wide: fls. white, to 1 in. across, in panicles to 1 ft. long; filaments with 2 tendril-like appendages. New Zeal.

ARTICHOKE: *Cynara Scolymus.* Chinese: *Stachys Sieboldii.* Japanese: *Stachys Sieboldii.* Jerusalem: *Helianthus tuberosus;* see *Girasole.*

ARTICULATE: jointed; provided with nodes or joints, or places where separation may naturally take place.

ARTILLERY PLANT: *Pilea microphylla.*

ARTOCARPUS. *Moraceæ.* Trees with milky juice, large alternate lvs., staminate fls. in stiff spikes, pistillate in heads, and fr. imbedded in the fleshy perianth forming a heavy syncarp; native in the Asian tropics and grown in trop. climates for the fr. or general interest. For cult. see *Breadfruit.*

Cannoni. Purple-lvd. greenhouse plant from the S. Seas, of doubtful botanical position: lvs. 3-ribbed from base and 2 basal side lobes and other lobes farther up, all the lobes toothed, sinuses open.

communis (*A. incisa*). Breadfruit. To 60 ft.: lvs. ovate, pinnately lobed, to 2 ft. and more long, dark green, thick and leathery: staminate spikes yellow, club-shaped, to 1 ft. long: fr. round or oval, to 8 in. across, yellow when ripe, covered with prickles. Polynesia.—The seedless forms are the breadfruits and those with seeds are known as breadnuts.

incisa: *A. communis.*

integra (*A. integrifolia*). Jakfruit or Jackfruit. To 70 ft.: lvs. elliptic or obovate, to 8 in. long, stiff and glossy, entire: staminate spikes cylindric or club-shaped, to 4 in. long: fr. oblong, to 2 ft. long, greenish-yellow turning brownish, covered with hard points. India to Malaya.

integrifolia: *A. integra.*

Lakoocha. To 60 ft.: lvs. oblong or elliptic, to 1 ft. long, entire, pubescent beneath: fr. globose, to 3 in. across, smooth or wrinkled. India to Malaya.

ARUM. *Araceæ.* Tuberous herbs native in Eu. and Asia, having arrow-shaped lvs. and unisexual fls. borne on a spadix surrounded by a spathe which is often colored; many plants once named in Arum are now transferred to other genera. See *Sauromatum* for the plant sometimes known as *A. cornutum.*

Arums require rich soil, plenty of water, and shady positions. Grown in pots in the greenhouse or some species hardy out-of-doors Propagated by offsets of the tubers or by seeds.

crinitum: *Helicodiceros muscivorus.*

Dracunculus: *Dracunculus vulgaris.*

italicum. A variable species of robust habit: lvs. about 8 in. long and broad, with petioles about 1½ ft. long: spathes green, white inside with purple limb which is reflexed over opening. Eu., N. Afr.

maculatum. Cuckoo-Pint. Lords-and-Ladies. A variable species to about 1 ft. high: lvs. to 10 in. long, the petioles about twice as long: spathes erect, to 10 in. long, green margined and often spotted with purple. Eu., N. Afr.

palæstinum. Black Calla. Lvs. to 8 in. long, the petiole about 1 ft. long: spathes green with limb deep purple inside. Syria, Palestine.

ARUM, ARROW-: *Peltandra.* **Ivy-:** *Scindapsus.* **Twist-:** *Helicodiceros muscivorus.* **Water-:** *Calla palustris.*

ARUNCUS. Goats-Beard. *Rosaceæ.* Per. erect hardy herbs with 2–3-pinnate long-stalked lvs., small white unisexual fls. in spikes forming large panicles, and fr. of separate follicles, stamens numerous; native in the north temp. zone.

These plants thrive in moist partially shady locations; attractive because of the upright astilbe-like panicles of numerous small flowers. Propagated by seeds.

sylvester (*Spiræa Aruncus. S. Humboldtii*). To 7 ft.: lvs. ovate to oblong-lanceolate, to 5 in. long, toothed. N. Amer., Eu., Asia.

ARUNDINARIA. *Gramineæ.* Large shrubby grasses differing from Bambusa in having 3 instead of 6 stamens and other technical characters of florets; native in N. Amer. and Asia. See *Bamboo.*

aristata: *Thamnocalamus aristatus.*

aureo-striata: *Sasa aureo-striata.*

auricoma: *Sasa auricoma.*

chrysantha: *Sasa chrysantha.*

debilis. To 10 ft., much branched: lvs. to 3 in. long and ⅓ in. across, nearly glabrous. Ceylon.

erecta: *Thamnocalamus Hindsii.*

falcata (*Bambusa falcata*). To 20 ft., sts. yellow-green: lvs. to 6 in. long and ½ in. wide, sheaths ciliate at apex. Himalayas.

Falconeri: *Thamnocalamus Falconeri.*

fastuosa (*A. Narihira. Bambusa fastuosa*). To 40 ft., sts. hollow, marked with purplish-brown: lvs. to 7 in. long and 1 in. wide, shining above, glaucous beneath, slightly pubescent. Japan.

Fortunei: *Sasa variegata.*

gracilis: *Sasa humilis.*

Hindsii: *Thamnocalamus Hindsii.*

Hookeriana. To 30 ft., glaucous: lvs. to 6 in. long and ¾ in. wide, glabrous, rough on edges. Himalayas.

humilis: *Sasa humilis.*

japonica: *Sasa japonica.*

jaunsarensis. To 15 ft., sts. with yellow scales at base: lvs. to 6 in. long and ¾ in. wide, rough on edges. Himalayas.

macrosperma. Southern Cane. Cane Reed. To 25 ft.: lvs. to 1 ft. long and 1¼ in. wide, finely toothed, glabrous or pubescent. Va. to Fla. and La., in swamps and by rivers.

marmorea (*Bambusa marmorea*). To 3 ft. or more, sheaths marbled with purple: lvs. to 5 in. long and ¾ in. wide, toothed, bright green. Japan.

Maximowiczii: *A. Simoni* var. *Chino.*

Metake: *Sasa japonica.*

Murielæ. To 12 ft., sts. yellow: lvs. to 5 in. long and ½ in. wide, long-bristly-acuminate, rough above, China.

Narihira: *A. fastuosa.*

nitida. To 20 ft., st.-sheaths purplish: lvs. to 3 in. long and ½ in. wide, glaucous beneath. China.—The hardiest of the arundinarias.

nobilis: *Thamnocalamus Falconeri.*

palmata: *Sasa senanensis* var. *nebulosa.*

pumila: *Sasa pumila.*

pygmæa: *Sasa pygmæa.*

quadrangularis: *Bambusa angulata.*

Ragamowski: *Sasa tessellata.*

Simoni (*Bambusa Simoni*). To 25 ft.: lvs. to 1 ft. long and 1 in. wide, often striped with white. China, Japan. Var. **Chino** (*A. Maximowiczii, Bambusa Laydeckeri*) is shorter with smaller lvs. mottled with yellow. Var. **striata** has lvs. striped white.

tecta. Similar to *A. macrosperma* and often treated as a variety but smaller, to 12 ft. high. Md. and Ind. to Tex., in low grounds and swamps.

tessellata: *Sasa tessellata.*

Veitchii: *Sasa Veitchii.*

ARUNDO. *Gramineæ.* Very tall per. grasses with large flat lvs. and spikelets borne in large terminal plume-like close panicles; native in warm parts of the Old World and planted for bold effects. See *Grasses.*

Donax. Giant Reed. To 20 ft., sts. or canes rather woody: lvs. to 2 ft. long and 3 in. wide: spikelets hairy, on ascending branches in erect panicles to 2 ft. high. Medit. region; more or less escaped in warm countries, and not hardy in the northern states. Var. **versicolor** (var. *variegata*) has yellowish- or white-striped lvs.

ASARUM. Wild Ginger. *Aristolochiaceæ.* Stemless per. herbs with long-stalked heart-shaped lvs. and large purplish or brown fls. borne singly near surface of ground; native in north temp. zone and sometimes transplanted to woodsy places from the wild. They require moist rich soil.

canadense. Lvs. 2, to 7 in. across, on stalks to 1 ft. long: fls. brownish-purple, 1 in. across, Apr.–May. N. B. to N. C. and Mo.

caudatum. Lvs. 2, to 6 in. across, on stalks to 7 in. long: fls. brownish-purple, with lobes prolonged into tails to 2 in. long, June. B. C. to Calif.

europæum. Lvs. 2, to 3 in. across, on stalks to 5 in. long: fls. greenish-purple or brown, ½ in. long. Eu.

Hartwegii. Lvs. to 5 in. across, on stalks to 8 in. long, mottled with white: fls. brownish-purple, ½ in. across, with lobes prolonged into tails to 2½ in. long. Ore., Calif.

Lemmoni. Lvs. 3 in. across: fls. brownish-purple, ⅓ in. across. Calif.

Shuttleworthii (*Hexastylis Shuttleworthii*). Lvs. 1–2, to 3 in. across, on stalks to 8 in. long, usually mottled: fls. mottled violet within, to 2 in. long, May–July. Va. to Ga. and Ala.

virginica (*Hexastylis virginica*). Lvs. 1–3, to 3 in. across, on stalks to 7 in. long, usually mottled: fls. purple, to ⅔ in. long, May–June. Va. to S. C. and Tenn.

ASCARINA. *Chloranthaceæ.* Aromatic shrubs and trees native in New Zeal. and the Pacific Isls., having opposite lvs., minute unisexual fls. in spikes, and fr. a drupe; sometimes grown in Calif.

lucida. To 25 ft.: lvs. oblong, to 2 in. long, coarsely toothed, glossy dark green above: spikes branched and drooping. New Zeal.

ASCENDING: in an upward direction but not truly erect; produced somewhat obliquely or indirectly upward.

ASCLEPIADACEÆ. MILKWEED FAMILY. About 220 genera of herbs, shrubs, frequently vines, widely distributed over the earth, particularly in the tropics, mostly with milky juice, opposite or whorled lvs., regular fls. commonly bearing a curious internal crown, anthers adhering to the stigma and the pollen united in masses called pollinia, monadelphous stamens, and fr. of 2 follicles with the seeds usually bearing long tufts of hair; many have medicinal and poisonous properties and some are grown for ornament, as Araujia, Asclepias, Asclepiodora, Ceropegia, Chlorocodon, Cryptolepis, Cryptostegia, Cynanchum, Duvalia, Echidnopsis, Gomphocarpus, Hoya, Huernia, Marsdenia, Periploca, Philibertia, Stapelia, Stephanotis, Vincetoxicum.

ASCLEPIAS. MILKWEED. SILKWEED. *Asclepiadaceæ.* Per. summer- or autumn-blooming milky herbs with fls. in axillary or terminal umbels, the 5 parts of the corolla strongly reflexed, showing a crown of 5 horned hoods: fr. 1 or 2 soft follicles, containing seeds with long silk: mostly native in N. and S. Amer. and Afr.

Of easy cultivation in the wild-garden or border; many of them have attractive habit, showy flowers and ornamental pods. Propagated by division, and also by seeds.

Cornuti: *A. syriaca.*

curassavica. BLOOD-FLOWER. To 3 ft.: lvs. oblong: fls. with reddish-purple corolla and orange hoods. Trop. Amer.; nat. in S. U. S.

exaltata: name sometimes used for *A. phytolaccoides.*

Hallii. To 16 in.: lvs. lanceolate to ovate-lanceolate: fls. greenish tinged with purple. Colo.

incarnata. SWAMP M. To 4 ft.: lvs. oblong-lanceolate: fls. rose-purple, rarely white (var. alba), to ¼ in. across. Swamps, N. B. to La. and Colo. Var. **pulchra** (*A. pulchra*) has broader lvs. and is hairy.

mexicana. To 5 ft.: lvs. glabrous, whorled or opposite, linear to narrow-lanceolate, to 6 in. long: fls. greenish-white, sometimes tinged purple. Ore. to Mex.

phytolaccoides. To 6 ft.: lvs. oval to oblong: fls. greenish-purple with white or pink hoods. Me. to Ga. and Ark.

pulchra: *A. incarnata* var.

rubra. To 4 ft.: lvs. ovate to lanceolate: fls. purplish-red, to ½ in. across. N. J. to Fla. and Tex.

speciosa. To 2½ ft., white-tomentose: lvs. ovate or oval: fls. purple-green, with long hoods. Minn. to B. C. and Calif.

subulata. To 5 ft., with rush-like sts. leafless or with few thread-like lvs.: fls. yellowish-white. Desert regions of Nev., Calif., Lower Calif.

Sullivantii. To 4 ft.: lvs. thick, oblong to ovate-oblong: fls. purplish. Ont. to Minn. and Kans.

syriaca (*A. Cornuti*). To 5 ft.: lvs. oblong to ovate, pubescent beneath: fls. green or purplish. N. B. to N. C. and Kans.

tuberosa. BUTTERFLY-WEED. PLEURISY-ROOT. To 3 ft., rough-hairy: lvs. lanceolate or oblong: fls. orange. Me. to Fla. and Ariz.

verticillata. HORSETAIL M. To 2 ft.: lvs. narrowly linear, in 3's to 7's: fls. greenish-white. Me. to Fla. and N. Mex.

ASCLEPIODORA. *Asclepiadaceæ.* N. American per. herbs differing from Asclepias in the spreading corolla and the hoods with a crest instead of a horn; sometimes transplanted to the wild-garden.

decumbens. Sts. to 1½ ft. long, decumbent or ascending: lvs. lanceolate to linear, to 6 in. long, thick: fls. greenish with purplish hoods, in umbels 2 in. across. Ark. to N. Mex.

ASCOCENTRUM. *Orchidaceæ.* Short-stemmed epiphytes with many linear lvs. and fls. in many-fld. short-stalked racemes, the sepals and petals equal. See *Orchids* for cult.

miniatum (*Saccolabium miniatum*). Fls. orange-red, nearly 1 in. across, May–June. Borneo.

ASCOTAINIA. *Orchidaceæ.* Terrestrial orchids with 1-lvd. pseudobulbs and fls. in terminal racemes, the sepals and petals similar, the lip entire or 3-lobed and and with 3–5 keels. See *Orchids* for cult.

viridifusca (*Tainia viridifusca*). Lvs. about 16 in. long and 2 in. wide: fls. with olive-green sepals and petals and yellowish-white lip, the racemes to 3 ft. high, Feb.–Mar. Burma.

ASCYRUM. *Hypericaceæ.* Low herb-like shrubs with opposite entire lvs. and bright yellow 4-parted fls. in terminal few-fld. cymes; native in N. and Cent. Amer. and Himalayas; differs from Hypericum in 4 rather than 5 sepals in 2 unequal pairs and in the separate stamens. Hardy in the N. with winter protection. Propagated by division and seeds.

filicoides: listed name.

hypericoides. ST. ANDREWS CROSS. To 2½ ft., much branched and often decumbent: lvs. oblong to linear, to 1½ in. long: fls. ½ in. across. Mass. to Cent. Amer. and W. Indies.—Evergreen S. and useful in landscape work.

ASEXUAL: sexless; without sex, as in propagation by means of vegetative shoots rather than by seeds, also of flowers without stamens or pistils.

ASH: *Fraxinus.* Mountain-: *Sorbus.* Prickly-: *Zanthoxylum americanum.*

ASIMINA. *Annonaceæ.* N. American shrubs or small trees with alternate simple lvs., axillary nodding white or purplish fls., and fr. of 1 or more berries.

They thrive in rich moist soil. Propagated by seeds sown in autumn or stratified, by layers, and by root-cuttings. Only *A. triloba* is hardy North.

angustifolia. Shrub to 3 ft.: lvs. linear or oblanceolate, to 8 in. long: fls. white or yellowish, to 3 in. across: fr. to 2 in. long. Ga., Fla.

speciosa. Shrub to 4 ft.: lvs. oblong or obovate, to 6 in. long, tomentose on both sides: fls. yellowish-white, 3–4 in. across, before the lvs. Ga., Fla.

triloba. PAPAW. Deciduous tree to 30 ft.: lvs. obovate-oblong, to 1 ft. long, drooping: fls. purple, to 2 in. across, before the lvs.: fr. fleshy, 3–5 in. long, edible. N. Y. to Fla. and Tex.

ASOKA: *Saraca indica.*

ASPARAGUS. *Liliaceæ.* Per. herbs or woody vines and shrubs with fleshy, tuberous or cord-like roots, one a common garden vegetable and others grown for the ornamental green: lvs. reduced to scales, the branchlets (cladodes) narrow, green and leaf-like: fls. small and greenish: fr. a berry.

The decorative kinds are of easy culture but most of them are tender to frost. They are commonly grown under glass or other cover. Propagated by seed and division, and woody kinds also by cuttings. See *Semele;* also *Asparagus, Garden.*

asparagoides (*A. medeoloides. Myrsiphyllum asparagoides*). SMILAX A. SMILAX of florists. Branching vine: lvs. ovate, about 1 in. long: fls. 1–2 together, greenish-white: berries dark purple, ¼ in. across. S. Afr. Var. **myrtifolius**, BABY S., is a more graceful form with smaller lvs.

Cooperi. Vine to 60 ft.: lvs. very dark green, to ½ in. long, making fern-like sprays: fls. white: berries red, ¼ in. across. S. Afr.

Crawshawi: an unidentified trade name.

crispus (*A. decumbens*). Climbing or drooping, to 6 ft.: lvs. needle-like, to ⅝ in. long: fls. 1 or 2 together, white, fragrant: berries white or pink, ½ in. across. S. Afr.

decumbens: *A. crispus.*

drepanophyllus (*A. Duchesnei*). Climbing to 30 ft.: lvs. linear and sickle-shaped, to 3 in. long, forming fern-like fronds: fls. in erect racemes, greenish: berries scarlet, ½ in. across. Cent. Afr.

Duchesnei: *A. drepanophyllus.*

elongatus: *A. virgatus.*

falcatus. Climbing to 40 ft.: lvs. linear-lanceolate and sickle-shaped, to 3 in. long, dark green: fls. in racemes, white: berries brown. Trop. Asia and Afr.

laricinus. Shrub with woody much branched sts.: lvs. awl-shaped, to 1 in. long: fls. clustered: berries ⅙ in. across. S. Afr.

Lutzi: an unidentified trade name.

madagascariensis. Shrub to 1 ft.: lvs. lanceolate, ⅝ in. long, so arranged as to resemble a pinnate lf.: fls. creamy-white, 4 together: berries scarlet. Madagascar.

medeoloides: *A. asparagoides.*

myriocladus. Nearly erect shrub to 6 ft.: lvs. thread-like, ¼ in. long: fls. in racemes to 1 in. long. Natal.

myrtifolius: *A. asparagoides* var.

nanus: *A. plumosus* var.

officinalis: see *Asparagus, Garden.*

plumosus. FERN A. Tall climbing, the long fern-like strands cut for decoration: lvs. needle-like, to ¼ in. long, bright green: fls. whitish, 1–4 together: berries purple-black, ¼ in. across. S. Afr. Var. **comorensis** is a robust form. Var. **compactus** is dwarf as is also var. **nanus**, DWARF A. Var. **robustus** is a strong-growing sort. Var. **tenuissimus** has wiry sts.—Popular in its various forms.

retrofractus. Shrub to 6 ft., slightly climbing: lvs. thread-like, 1 in. long: fls. white, in umbels. S. Afr.

scandens. Climbing to 6 ft.: lvs. linear and curved, to ½ in. long: fls. greenish-white, nodding, 1–2 together: berries scarlet, ⅙ in. across. S. Afr. Var. **deflexus** is a smaller form with deflexed branches.

schoberioides. Erect, to 3 ft.: lvs. flat, 3-angled: berries red. China, Japan.

Siebertii: hort. name.

Sprengeri. Climbing to 6 ft.: lvs. linear, 1 in. long: fls. in racemes, pinkish, fragrant: berries bright red, ½ in. across. S. Afr. Var. **compactus** is a dwarf form and **variegatus** had variegated lvs.

tenuissimus: *A. plumosus* var.

tetragonus. Climbing to 20 ft., roots tuberous: lvs. 3–4-angled, to ⅝ in. long: fls. white or pink, in racemes to 3 in. long, fragrant. S. Afr.

verticillatus. Climbing to 15 ft., somewhat woody: lvs. thread-like, to 2 in. long: fls. 1–4 together: berries red, ¼ in. across. Persia to Siberia.

virgatus (*A. elongatus*). Erect, to 6 ft.: lvs. needle-like, to ¾ in. long, dark green: fls. greenish-white, solitary: berries orange-red, ⅙ in. across. S. Afr.

ASPARAGUS, GARDEN or ESCULENT (*Asparagus officinalis* var. *altilis*). A developed or ameliorated cultivated form of the native *Asparagus officinalis* of the seacoasts of Europe and Asia, hardy perennial, grown for its edible spring shoots; it has somewhat run wild near habitations in places; the indigenous plant in its native countries is short-branched and more or less prostrate at base whereas the domestic asparagus (var. *altilis*) is strongly erect, to 3 feet or more. The genus comprises also many ornamental subjects: see *Asparagus*, preceding this article.

The edible asparagus is a universal favorite in the spring and is extensively cultivated. A plantation should yield well for ten years or more, but this longevity is dependent on good land deeply and thoroughly prepared in the beginning, fertile and enriched every year with good manure or concentrated fertilizer or both. Thickly planted garden beds are likely to run out sooner by overcrowding, and also by lack of tillage and other care.

Asparagus is propagated only by seeds, which are sown in drills 12–20 inches apart depending on the value of land and the method of tillage; thin to 3 or 4 inches in the drill or row. Till frequently, to keep the plants vigorous and keep the bugs away. The following spring the plants may be set in the permanent plantation; that is, the plants are yearlings. Seedlings vary considerably, and only the strongest should be saved for planting. Varieties are several; but the size and vigor depend largely on land, tillage and general care. Colossal, Palmetto, Columbian, Barr, Eclipse are well-known kinds.

Plants are set permanently about 18–24 inches apart in rows 3 feet or more asunder; in field culture with horse tillage and particularly when plants are to be banked, the rows are often 8–10 feet apart; 4–5 feet is a good distance for most home places. Sometimes beds are planted much thicker, but very large succulent stalks are not to be expected. In the kitchen-garden a row at one side but where tillage may be given and 75 to 100 feet long should supply the usual family. The plants should be set deep, usually 6–8 or 10 inches in a furrow but not covered more than 2 or 3 inches at first; the furrow or trench is filled as the plants grow. Cutting should not be begun to any extent until the plants have grown two years. At three years the bed is usually ready for a full cutting. If a knife is used for cutting asparagus, make sure that it is given a slanting direction so that younger shoots beneath the surface will not be severed.

Keep the plantation free of weeds; till in early spring before the plants are up; till after cutting ceases and continue until the tops become too large. When growth is completed in autumn, cut down the plants and remove them to destroy the seeds and also the rust. The beetle is controlled by spraying with arsenicals after the cutting season is past; sometimes a row is allowed to grow to attract the beetles, on which they may be poisoned; hand-picking is practicable on small home plantations; let poultry run in the patch. The beetles hibernate in rubbish about the place.

Asparagus is blanched by hilling up or banking, much as is celery. The natural green shoots are of better quality. The tenderness is a question of fertile soil, rapid growth and frequent cutting.

ASPEN: *Populus.*

ASPERULA. WOODRUFF. *Rubiaceæ.* Herbs with square sts., whorled lvs. and small funnelform 4-lobed fls. in forking cymes in early summer; native in Eu., Asia and Australia.

Woodruffs are grown in borders or rock-gardens where they thrive in shady situations in moist soil, although *A. orientalis* does well in the open flower-garden. Propagated by seeds and by division of the roots and clumps.

azurea-setosa: *A. orientalis.*

cynanchica. Per. to 1 ft.: lvs. in 4's, linear, to ⅔ in. long: fls. white or pink, tube longer than lobes. Eu., Asia.

hexaphylla. Per. to 2 ft. or more: lvs. in 6's, linear: fls. white, tube three times as long as lobes. S. Eu.

lævigata. Per. to 1½ ft.: lvs. in 4's, oval: fls. white, very small. S. Eu.

odorata. SWEET W. Per. to 8 in., spreading, herbage fragrant: lvs. in 8's, lanceolate: fls. white. Eu., Asia.

orientalis (*A. azurea-setosa*). Ann. to 1 ft.: lvs. in 8's, lanceolate: fls. blue. Eu., Asia.—A good flower-garden plant.

tinctoria. DYERS W. Per. to 2 ft., with reddish roots: lvs. in 4's and 6's, linear: fls. white or reddish. Eu.

ASPHODEL: *Asphodelus;* also *Asphodeline lutea.*

ASPHODELINE. JACOBS-ROD. *Liliaceæ.* Herbs with fleshy roots, simple sts., and white or yellow fls. in dense long racemes.

Hardy and of easy cultivation in any soil, useful for border or wild-garden. Propagated by division, and by seeds when available.

Balansæ. To 2 ft.: lvs. all basal, linear, to 10 in. long: fls. white, about ½ in. long. Cilicia.

lutea (*Asphodelus luteus*). ASPHODEL of the ancients. To 4 ft., with leafy sts.: lvs. linear, to 1 ft. long: fls. yellow, fragrant, 1 in. long. Medit. region.

ASPHODELUS. ASPHODEL. *Liliaceæ.* Fleshy-rooted herbs with basal lvs. and white funnel-shaped fls. in racemes terminating leafless scapes.

Of easy culture in the open, in the border or wild-garden. Propagated by division.

albus. Per. to 4 ft.: lvs. 3-angled: fls. ¾ in. long. Medit. region.

luteus: *Asphodeline lutea.*

ramosus. Per. to 5 ft.: lvs. sword-shaped: fls. in a branching infl. Medit. region.

ASPIDISTRA. *Liliaceæ.* Per. herbs with thick roots, stiff and shining basal lvs., and dark bell-shaped fls. borne singly at surface of ground and obscured by foliage (and therefore not often observed).

Popular florists window-box and porch plants. They withstand hard usage, dull light and poor soil. Propagated by division in early spring.

elatior (*A. lurida*). Lvs. to 2½ ft., oblong-elliptic, to 4 in. across, evergreen: fls. purple-brown, 1 in. across. China. Var. **punctata** has larger fls. which are pale green spotted with purple inside. Var. **variegata** has lvs. striped green and white.

lurida: *A. elatior.*

ASPIDIUM: *Cyrtomium, Dryopteris, Polystichum.*

ASPIDOSPERMA. *Apocynaceæ.* Trees with hard wood, native in S. Amer. and W. Indies, having simple lvs., small fls. in many-fld. terminal panicles, and fr. of 2 roundish or oblong follicles; one species has been planted in S. Calif.

Quebracho-blanco. Tall tree with trunk to 3 ft. thick and white wood: lvs. oval-lanceolate, to 3 in. long and 1 in. wide, entire, leathery and shining: fls. white: fr. to 3 in. long. Argentina.

ASPLENIUM. SPLEENWORT. *Polypodiaceæ.* A large genus of ferns, some of them native in the N. and therefore hardy, but most cult. kinds are grown in the greenhouse, usually evergreen with simple, deeply cut or compound lvs.; sori attached to upper side of veinlets. Some of the species are now treated under Athyrium.

They require no special handling, but under glass should not be too much exposed to strong sunshine; if kept too wet they may lose color in the slow season. See *Ferns.*

acrostichoides: *Athyrium acrostichoides.*

angustifolium: *Athyrium angustifolium.*

Belangeri. Lvs. evergreen, long and narrow, to 1½ ft. long and 4 in. wide, 2-pinnate, segms. ¼ in. long, entire, often bulblets at the axils. Malaya.

bulbiferum. MOTHER S. Lvs. to 4 ft. long and 1 ft. broad, 2–3-pinnate, segms. to 1½ in. long, lobed or divided, with bulbs or plantlets on upper surface. New Zeal., Australia, Malaya. Var. **laxum** is smaller with finer foliage.

ebeneum: *A. platyneuron.*

Filix-femina: *Athyrium Filix-femina.*

gemmiferum. Lvs. to 2 ft. long and 8 in. wide, simply pinnate, segms. to 6 in. long, slightly toothed. Afr., Madagascar.

Goeringianum: *Athyrium Goeringianum.*

Hemionitis. Lvs. 6 in. long and wide, hastate, with 2 lateral lobes and triangular terminal lobe. Spain, Canary Isls.

lanceum *Diplazium lanceum.*

longissimum. Lvs. to 8 ft. long, simply pinnate, segms. to 4½ in. long, slightly toothed, rooting at tips, stalks blackish, to 1 ft. long. Malaya.

lucidum Lvs. leathery, to 3 ft. long and 14 in. wide, simply pinnate, segms. to 6 in. long, wavy-toothed, stalks grayish, scaly, to 1½ ft. long. New Zeal.

Nidus (*A. Nidus-Avis*). BIRDS-NEST-FERN. Lvs. simple, bright green, stiff, erect, to 4 ft. long and 8 in. wide, entire, wavy or slightly lobed. Asia, Polynesia.

Nidus-Avis: *A. Nidus.*

platyneuron (*A. ebeneum*). EBONY S. Hardy: lvs. to 15 in. long and 3 in. wide, pinnate, stalks purplish-brown. Vt. to Va. and Ala.

pycnocarpon: *Athyrium angustifolium.*

thelypteroides: *Athyrium acrostichoides.*

Trichomanes. MAIDENHAIR S. Hardy: lvs. evergreen, simply pinnate, clustered, to 8 in. long and ¾ in. wide, segms. about ½ in. long, slightly toothed. N. Amer., Eu., Asia.

viviparum. Lvs. to 2 ft. long and 8 in. wide, 2-pinnate, segms. about ¼ in. long, often bulb-bearing. Mauritius, Bourbon.

ASPRELLA HYSTRIX: *Hystrix patula.*

ASPRIS. *Gramineæ.* Small mostly ann. grasses of the Medit. region, with narrow lvs. and spikelets borne in loose panicles; one species is planted for ornament and use in dry bouquets. See *Grasses.*

capillaris (*Aira capillaris*). Ann. to 1½ ft.: lvs. hair-like: panicles with many spreading thread-like branches. Var. **pulchella** (*Aira pulchella, Agrostis pulchella*) has awned florets.

ASSONIA: *Dombeya.*

ASTARTEA. *Myrtaceæ.* Australian heath-like shrubs with small opposite lvs. and small pink or white fls. solitary in the axils; one species occasionally planted in S. Calif.

fascicularis. To 10 ft.: lvs. linear, ¼ in. long, sometimes clustered. W. Australia.

ASTELIA. *Liliaceæ.* Tufted per. herbs native in New Zeal., Australia and Pacific Isls., with linear mostly basal lvs. and small unisexual fls.; one species is grown in the open in S. Calif.

nervosa. Lvs. to 8 ft. long and 3 in. wide, leathery, many-nerved, margins recurved: fls. dark green, fragrant, to ½ in. across, in much branched panicles.

ASTER. STARWORT. MICHÆLMAS DAISY. *Compositæ.* Herbaceous leafy-stemmed perennials, rarely annuals, with alternate lvs. and fl.-heads usually clustered, sometimes solitary, blooming in summer and autumn; rays numerous, flattish, white, blue, red or purple; disk-fls. mostly yellow; pappus of bristles. Asters of many kinds are characteristic of the N. American autumnal flora. Some of them, as *A. novi-belgii*, have been much modified under cult. The species here listed are perennials.

Most perennial asters thrive best in a medium rich soil. The named garden forms are increased usually by division or cuttings as seeds do not reproduce true to type. The more common native asters may be propagated by seed sown in spring for bloom the following year, or by division in either autumn or spring. They are adapted to rear borders, for colonizing, and for bold clumps. The China aster of flower-gardens is a different plant: see *Callistephus.*

acris. To 3 ft., rough-hairy: lvs. linear, entire, to 1½ in. long: heads clustered, to 1¼ in. across; ray-fls. blue. S. Eu. Var. **nanus** is very dwarf, not over 15 in.

acuminatus. To 3 ft., slightly pubescent: lvs. broad-oblong, to 6 in. long, sharp-toothed: heads clustered, to 1½ in. across; ray-fls. white or purplish. Lab. to Ga.

alpinus. ROCK A. To 10 in., pubescent: lvs. spatulate to linear-lanceolate, to 2 in. long, entire: heads solitary, 1½ in. across; ray-fls. blue or violet. Mts. of Eu., Asia, W. N. Amer. Var. **albus** has white fls., **ruber** rosy-purple, **speciosus** heads to 4 in. across. Var. **superbus** is larger and more showy.

amelloides: *A. Amellus.*

Amellus (*A. amelloides. A. ibericus*). ITALIAN A. To 2 ft., rough-hairy: lvs. oblong or oblong-lanceolate, nearly entire: heads clustered, to 1¾ in. across; ray-fls. purple. Eu., Asia. Var. **bessarabicus** (*A. bessarabicus*) has larger deeper purple fls. Var. **elegans** is lower and free-flowering.

amethystinus. To 5 ft., rough-hairy: lvs. linear-lanceolate, to 2 in. long, entire: heads clustered, to 1 in. across; ray-fls. blue or violet. Vt. to Neb.

Andersoni. To 15 in.: lvs. mostly basal, linear, to 8 in. long, entire: heads solitary, to 2 in. across; ray-fls. purple or blue. Calif.

apricus. To 8 in., pubescent: lvs. oblong, to 2 in. long: heads usually solitary; ray-fls. purple. B. C. to Colo.

azureus. To 4 ft., rough-hairy: lvs. ovate to lanceolate, entire, to 6 in. long, the lower cordate and long-stalked: heads numerous, ½ in. across; ray-fls. bright blue. Ont. to Ga. and Tex.

Bellidiastrum (*Bellidiastrum Michelii*). To 1 ft.: lvs. in a basal rosette, toothed: heads single; ray-fls. white. S. Eu.

bessarabicus: *A. Amellus* var.

Bigelovii (*Machæranthera Bigelovii*). Bien. to 3 ft., pubescent: lvs. oblong or lanceolate, coarsely toothed: heads clustered, to 2½ in. across; ray-fls. violet. Colo. to Ariz.

brachystachys: a listed name.

brachytrichus. To 10 in.: lvs. obovate, to 2¼ in. long: heads solitary, to 2 in. across; ray-fls. violet. China.

cabulicus: *Microglossa albescens.*

cassiarabicus. To 2 ft., pubescent: lvs. ovate, toothed: heads clustered; ray-fls. pink. Russia.

caucasicus. To 2 ft.: lvs. ovate to oblong-lanceolate, to 2 in. long, slightly toothed: heads solitary, about 1½ in. across; ray-fls. purple. Caucasus.

Chapmani. To 3 ft., unbranched, glabrous: lvs. linear, to 1 ft. long, entire: heads solitary, to 1 in. across; ray-fls. violet. Fla.

cognatus. To 1½ ft., shrubby: lvs. elliptic or oblong, to 1¼ in. long, spiny-toothed: heads solitary, to 2 in. across; ray-fls. blue or violet. Desert, Calif.

cordifolius. BLUE WOOD A. To 5 ft., much branched: lvs. ovate to lanceolate, to 5 in. long, the basal cordate and long-stalked, pubescent: heads numerous, to ¾ in. across; ray-fls. violet or blue. N. S. to Ga. and Mo. Var. **versicolor**, with light pink fls., is listed.

corymbosus: *A. divaricatus.*

Curtisii. To 5 ft., glabrous: lvs. varying from linear to ovate, toothed: heads panicled, 1 in. across; ray-fls. violet-blue. N. C., Tenn. to Ga.

decurrens: *A. lævis.*

Delavayi. To 3 ft.: lvs. ovate-lanceolate, toothed: heads solitary, to 4 in. across; ray-fls. blue-purple; disk violet-brown. China.

delicata: hort. name.

diffusus: *A. lateriflorus.*

diplostephioides. To 3 ft., pubescent: lvs. lanceolate, to 3 in. long, entire: heads solitary, to 3 in. across; ray-fls. blue or pale purple. Himalayas.

divaricatus (*A. corymbosus*). WHITE WOOD A. To 2½ ft., glabrous: lvs. ovate-lanceolate, toothed, long-stalked: heads in corymbs, to 1 in. across; ray-fls. white. Que. to Ga. and Tenn.

dracunculoides (*Galatella dracunculoides*). Much branched, very leafy: lvs. linear-lanceolate: heads in corymbs; ray-fls. blue. S. Eu., W. Asia.

Drummondii. To 5 ft., pubescent: lvs. ovate or ovate-lanceolate, toothed, to 4 in. long, basal cordate: heads numerous, to ½ in. across; ray-fls. blue. Ohio to Minn. and Tex.

dumosus. To 3 ft.: lvs. linear or spatulate, to 3 in. long, entire: heads numerous, ½ in. across; ray-fls. blue to white. Mass. to Fla. and La.

Eatonii. To 3 ft.: lvs. linear, entire: heads numerous, ½ in. across; ray-fls. lavender to whitish. B. C. to Colo.

ericoides. HEATH A. To 3 ft.: lvs. spatulate to linear, to 3 in. long, toothed: heads numerous, ½ in. across; ray-fls. white or pinkish. Me. to Fla. and Mo. Var. **villosus** (*A. pilosus*) is pubescent.

Farreri. To 1½ ft., pubescent: lvs. linear or linear-lanceolate, to 6 in. long, entire: heads solitary, to 3 in. across; ray-fls. deep blue. Tibet.

floribundus: *A. novi-belgii.*

foliaceus. To 3 ft.: lvs. lanceolate, to 4 in. long, nearly entire: heads few, 1 in. across; ray-fls. violet. N. N. Amer.

formosissimus: hort. name.

Fremonti. To 1 ft.: lvs. oblanceolate, to 4 in. long, entire: heads in small corymbs; ray-fls. purple. B. C. to Colo.

Garibaldii is referred to *A. alpinus.*

grandiflorus. To 2½ ft., hairy, much branched: lvs. oblong to linear, to 2 in. long, entire: heads solitary, 2 in. across; ray-fls. deep violet. Va. to Fla.

Greatai. To 2½ ft., pubescent: lvs. obovate, to 8 in. long, toothed above middle: heads numerous; ray-fls. light purple. Calif.

Harrowianus. Shrub to 5 ft.: lvs. lanceolate, to 5 in. long, toothed: heads in corymbs; ray-fls. pale purplish-blue. China.

hesperius. To 3 ft., somewhat hairy: lvs. lanceolate, to 4 in. long, nearly entire: heads numerous; ray-fls. white or violet. Calif.

himalaicus. To 1½ ft., pubescent: lvs. obovate or oblong, to 2 in. long, entire or toothed: heads solitary, 1½ in. across; ray-fls. lilac-blue. Himalayas.

hybridus: hort. name of uncertain application.

ibericus: *A. Amellus.*

incisus: *Calimeris incisa.*

lævis (*A. decurrens*). To 4 ft., glabrous: lvs. ovate to lanceolate, to 5 in. long, entire or toothed: heads numerous, 1 in. across; ray-fls. blue or violet. Me. to La.—Modified in cult., and often grown in tropics.

lateriflorus (*A. diffusus*). To 5 ft.: lvs. ovate to linear-oblong, to 5 in. long, toothed: heads numerous, ⅓ in. across; ray-fls. white or pale purple. N. S. to N. C. and Tex. Var. **horizontalis** has long wide spreading branches.

likiangensis. Dwarf, glandular-hairy, to 9 in., bearing 1 head: lvs. mostly basal, lanceolate to ovate or obovate, to 1 in. or more long and ½ in. broad: head large, the rays blue-purple, about ¾ in. long. Yunnan, China.

lilacinus: hort. name of uncertain standing.

linariifolius (*Ionactis linariifolius*). To 2 ft., very leafy, hairy: lvs. linear, to 1½ in. long, entire, stiff: heads several, 1 in. across; ray-fls. violet or rarely white. Me. to Fla. and Tex.

Linosyris: *Linosyris vulgaris.*

Lipskyi. Differs from *A. subcæruleus* in the more robust habit and larger lilac fls. Tibet.

longifolius (*A. virgineus*). To 3 ft., much branched: lvs. lanceolate or linear-lanceolate, to 8 in. long, entire: heads numerous, 1 in. across; ray-fls. violet or pale purple. Lab. to Mont.

Maackii. To 2 ft., hairy: lvs. lanceolate, to 2½ in. long, nearly entire: heads solitary, large; ray-fls. bluish. Japan.

macrophyllus. To 3 ft., rough: lvs. cordate-ovate to oblong, to 10 in. long, toothed: heads numerous, about 1 in. across; ray-fls. lavender. Canada to Minn. and N. C.

Milesii: a listed name.

miser: a name of uncertain botanical standing.

multiflorus. To 7 ft., rough: lvs. linear or linear-oblong, to 1½ in. long, entire: heads crowded, ⅓ in. across; ray-fls. white. Me. to Ga. and Ariz.

nemoralis. To 2 ft., slender, st. puberulent: lvs. oblong-lanceolate or narrower, acute, to 3 in. long, dentate or entire, sessile: fls. violet or purplish, to 1½ in. across. Newf. to N. J. and west.

novæ-angliæ. New England A. To 5 ft., very leafy, hairy: lvs. lanceolate, to 5 in. long, entire: heads crowded, to 2 in. across; ray-fls. deep purple. Que. to S. C. and Colo. Var. **roseus** has rose fls.

novi-belgii (*A. floribundus*). New York A. To 3 ft., glabrous: lvs. oblong to linear-lanceolate, to 6 in. long, nearly entire: heads numerous, about 1 in. across; ray-fls. bright blue-violet. Newf. to Ga.—Many of the named hort. asters belong here, largely of European origin.

oblongifolius. To 2 ft. or more, pubescent, much branched: lvs. oblong to lanceolate, somewhat clasping, entire, acute, to 2 in. long: fls. violet to rose-pink. Pa. south and west.

paludosus. To 2½ ft., scarcely branched: lvs. linear, to 6 in. long, entire: heads few, to 2 in. across; ray-fls. deep violet. Swamps, N. C. to Fla. and Tex.

paniculatus. To 8 ft., much branched, nearly glabrous: lvs. lanceolate to linear, to 6 in. long, slightly toothed: heads numerous, ¾ in. across; ray-fls. white or tinged violet. N. B. to Mont. and Mo.

patens. To 3 ft., rough, branched: lvs. ovate-oblong, to 3 in. long, entire: heads solitary, 1 in. across; ray-fls. purplish-blue. Me. to Fla. and Tex.

Pattersoni (*Machæranthera Pattersonii*). To 8 in., bien., hairy: lvs. spatulate, to 2½ in. long, slightly toothed: heads solitary or few, 1 in. across; ray-fls. purple. Mts., Colo.

peregrinus. To 1½ ft.: lvs. oblong-lanceolate, to 2 in. long, entire or toothed: heads solitary, to 2 in. across; ray-fls. violet-purple. Alaska, N. Asia.

pilosus: *A. ericoides* var. *villosus.*

Porteri. To 1 ft., glabrous: lvs. linear or oblanceolate, to 4 in. long: heads numerous; ray-fls. white. Colo. Var. **superbus** is an improved form.

ptarmicoides. White Upland A. To 2 ft.: lvs. linear-lanceolate, to 6 in. long, nearly entire: heads corymbose, to 1 in. across; ray-fls. white. Mass. to Colo.

pulchellus: hort. name; perhaps *Erigeron pulchellus.*

puniceus. To 8 ft., with reddish hairy sts.: lvs. lanceolate, to 6 in. long, toothed or entire: heads numerous, to 1½ in. across; ray-fls. violet-purple to white. Swamps, Newf. to Minn. and Ga.

pyrenæus. To 1½ ft., rough-pubescent: lvs. oblong-lanceolate, toothed: heads solitary or few, 2½ in. across; ray-fls. lilac. S. Eu.

Radula. To 2 ft.: lvs. lanceolate, to 3 in. long, toothed: heads several, to 1½ in. across; ray-fls. violet. Swamps, Newf. to W. Va.

sagittifolius. To 5 ft.: lvs. ovate-lanceolate, to 6 in. long, toothed, the lower cordate or sagittate at base: heads crowded, ¾ in. across; ray-fls. light blue or purplish. N. B. to Ga. and Mo.

salicifolius. To 5 ft., much branched, glabrous: lvs. lanceolate or linear-lanceolate, to 4 in. long, entire or slightly toothed: heads numerous, 1 in. across; ray-fls. violet-purple to white. Me. to Fla. and Tex.

salviæfolius. Alpine: lvs. pubescent: fls. white, large, single. Japan.

Schreberi. To 3 ft.: lvs. cordate-triangular to lanceolate, to 7 in. long, toothed: heads corymbose, to 1 in. across; ray-fls. white. N. Y. to Mich. and Va.

sericeus. To 2 ft., much branched: lvs. oblong, to 1½ in. long, entire, silvery-pubescent: heads numerous, 1½ in. across; ray-fls. violet-blue. Ill. to Tex.

Shortii. To 4 ft.: lvs. cordate-ovate to lanceolate, to 6 in. long, nearly entire, pubescent beneath: heads numerous, 1 in. across; ray-fls. violet-bue. Pa. to Ga. and Tenn.

spectabilis. To 2 ft.: lvs. oval to linear-oblong, to 5 in. long, nearly entire: heads several, 1½ in. across; ray-fls. bright violet. Mass. to Del.

subcæruleus. To 1 ft., pubescent, unbranched: lvs. oblong, entire or toothed: heads solitary, to 2 in. across; ray-fls. pale blue. India.

tataricus. To 7 ft., hairy: lvs. lanceolate or ovate-lanceolate, the basal to 2 ft. long, entire: heads numerous, 1 in. or more across; ray-fls. blue or purple. Siberia.

tenuifolius. To 2 ft.: lvs. linear, to 6 in. long, entire: heads few, to 1 in. across; ray-fls. pale purple to white. Salt marshes, Mass. to Fla.

Thomsoni. To 3 ft., hairy: lvs. broad-ovate, to 4 in. long, coarsely toothed: heads few, to 2½ in. across; ray-fls. lilac. Himalayas.—Plants grown under this name may be forms of *A. novi-belgii.*

tortifolius. To 2 ft., shrubby, white-pubescent: lvs. linear to lanceolate, to 3 in. long, spiny-toothed: heads solitary, to 2¾ in. across; ray-fls. purple or violet. Desert, Calif., Utah.

Tradescanti. To 5 ft., much branched: lvs. linear-lanceolate or lanceolate, to 6 in. long, toothed or entire, glabrous: heads numerous, ½ in. across; ray-fls. white. Me. to Va. and Mo.

Tranchi: hort. name for a stout late purple-fld. plant.

tricephalus. Closely allied to *A. himalaicus* but taller and with red instead of white pappus. Himalayas.

trinervius. To 3 ft.: lvs. lanceolate-ovate, to 4 in. long, toothed, rough: heads corymbose, ½ in. across; ray-fls. blue or purple varying to white. Himalayas.

Tripolium. To 3 ft., glabrous: lvs. linear-lanceolate, entire: heads corymbose; ray-fls. blue. Eu.

turbinellus. Prairie A. To 3 ft., much branched: lvs. lanceolate, to 3 in. long, entire: heads usually solitary, 1 in. across; ray-fls. violet. Ill. to Neb. and La.

umbellatus (*Doellingeria umbellata*). To 8 ft.: lvs. lanceolate, to 6 in. long, entire: heads corymbose, ¾ in. across; ray-fls. white. Newf. to Ga. and Ia.

undulatus. To 3½ ft., rough-pubescent, much branched: lvs. ovate-cordate to lanceolate, to 6 in. long, entire or wavy-margined: heads numerous, ¾ in. across; ray-fls. pale blue or violet. N. B. to Fla. and La.

versicolor. To 3 ft., glabrous: lvs. oblong-lanceolate, slightly toothed: heads corymbose, ½ in. across; ray-fls. violet or white. Probably N. Amer.

vestitus. To 2 ft., densely tomentose: lvs. narrow-lanceolate, to 2 in. long: heads corymbose, small· ray-fls. white. Yunnan.

virgineus: *A. longifolius.*

yunnanensis. To 2½ ft., pubescent: lvs. obovate or lanceolate, to 8 in. long, slightly toothed: heads solitary or 2–3, to 2½ in. across; ray-fls. violet-blue. Yunnan.

ASTER, BEACH: *Erigeron glaucus.* China: *Callistephus.* Golden: *Chrysopsis.* Stokes: *Stokesia.* Tree: *Olearia.*

ASTILBE (*Hoteia*). *Saxifragaceæ.* Strong herbaceous perennials with 2–3-ternately compound lvs. having toothed or cut lfts. and bearing panicles of white or pink fls.; Cent. and E. Asia and E. U. S. Often confused with the herbaceous spirea group, especially Aruncus, but those plants have many stamens and several to many separate pistils while the astilbes have usually only 8–10 stamens, and 2–3 pistils distinct or variously united. There are many variables and hybrid astilbes offered by florists; these are sometimes forced under the name Spiræa.

Astilbes are of easy cultivation and grow best in rich soil with plenty of water. Propagated by division or by seeds. They may be grown in the open border or forced under glass. It requires from ten to fourteen weeks to bring them into bloom when forced and they will need abundant moisture.

Arendsii. A series of hybrids of *A. Davidii* with different species is in the trade under this collective name; fls. range in color from purplish to nearly white.

astilboides (*Spiræa astilboides*). To 3 ft.: lvs. distinctly 2–3-pinnate; lfts. ovate, rounded at base, to 2½ in. long, sharp-toothed, hairy: fls. white, crowded in dense spikes, forming a panicle; petals very narrow. Japan.

biternata (*A. decandra*). To 6 ft.: lvs. to 2 ft. across; lfts. ovate, cordate to rounded at base, sharp-serrate, to 5 in. long: fls. numerous, yellowish-white, the fertile ones with minute petals or none. Mts., Ky. and Va. to Ga.

chinensis. To 2 ft.: lfts. doubly toothed, longer and narrower than in *A. astilboides:* fls. white, in narrow branching panicles. China.

Davidii (*A. chinensis* var. *Davidii*). To 6 ft., hairy: primary divisions of lvs. pinnate, the lfts. elm-like, to 1½ in. long, coarsely toothed: fls. rose-pink with dark blue anthers, densely clustered in long narrow panicles to 2 ft. long. China.

decandra: *A. biternata.*

grandis. To 6 ft.: lvs. ternately pinnate or 3-pinnate; lfts. ovate, doubly toothed, to 4 in. long, somewhat hairy: fls. creamy-white, crowded in panicles to 3 ft. long, with spreading branches. Cent. China.

hybrida: a name of uncertain application for garden forms.

japonica. To 3 ft.: lvs. 2–3-ternate; lfts. narrow-to lanceolate-ovate, sharp-toothed, wedge-shaped at base: fls. small, white, in erect terminal and axillary panicles; petals broad and obtuse. Japan.

Lemoinei. A race of garden hybrids in which *A. astilboides* has entered, having feathery panicles of white pink-stamened fls.

lobata: see *Filipendula rubra.*

rivularis. To 5 ft., with creeping rhizome: lvs. 2-ternate; lfts. ovate, toothed, to 3 in. long: fls. yellowish-white, in large panicles, the divisions spike-like. Nepal, W. China.

rosea. Hybrid between *A. chinensis* and *A. japonica:* similar to *A. japonica* in habit but fls. pinkish. The best known forms are Peach Blossom with lighter pink fls., and Queen Alexandra with deeper pink fls.

rubella. Hybrid with *A. Davidii* parentage, having rose-colored fls.

simplicifolia. Not over 1 ft.: lvs. simple, ovate, deeply lobed or cut, 3 in. long: panicle slender, narrow, with star-like white fls. Japan.

Thunbergii. To 2 ft.: lvs. 2–3-pinnate; lfts. ovate, to 3½ in. long, toothed, hairy: fls. white often becoming pink, in spreading panicles. Japan.

Ulmaria: see *Filipendula Ulmaria.*

ASTRAGALUS. MILK VETCH. *Leguminosæ.* Herbs with alternate pinnate lvs. and purple, white or yellow papilionaceous fls. mostly in spikes or racemes; occasionally planted in the border or rock-garden for ornament. Propagated by seeds or division in spring.

alopecuroides. Per. to 5 ft., pubescent: lfts. 1 in. long: fls. yellow, in spikes. Siberia.

alpinus (*Tium alpinum*). Per. to 15 in., often decumbent: lfts. to ½ in. long: fls. violet, in short racemes. Mts. of N. Eu., Asia and N. Amer.

austrinus (*Hamosa austrina*). Ann. or bien. to 16 in., often decumbent: lfts. to ⅓ in. long: fls. purplish, in head-like racemes. Tex. to Mex.

bisulcatus (*Diholcos bisulcatus*). Per. to 2½ ft., often decumbent: lfts. to 1 in. long: fls. purple, in dense spike-like racemes. Sask. to Colo.

ceramicus (*A. pictus. Phaca picta*). Per. to 8 in., gray-pubescent: lfts. to ¾ in. long: fls. yellowish-white, in few-fld. racemes. Colo. to New Mex.

Cicer. Ann., procumbent, sts. to 1½ ft. long: lfts. to 1 in. long: fls. yellowish, in spikes. Eu.

Drummondii (*Tium Drummondii*). Per. to 2½ ft., pubescent: lfts. ½ in. long: fls. cream-colored, in racemes to 4 in. long. Sask. to Colo.

Echinus. Shrub, much branched and spiny: lfts. oblong-lanceolate, spiny: fls. in globose heads. Asia Minor.

falcatus. Per. to 2 ft.: lfts. elliptic-oblong: fls. greenish-yellow, in spikes. Siberia.

flexuosus (*Homalobus flexuosus*). Per. to 1½ ft., sts. flexuous or decumbent: lfts. to ½ in. long: fls. purple, in racemes. Plains Sask. to New Mex.

frigidus (*Phaca frigida*). Per. to 2 ft.: lfts. to 1 in. or more long: fls. yellowish-white, in short racemes. Eu.

goniatus. To 10 or 12 in., zigzag and more or less decumbent, from a cespitose rootstock: lfts. 15–21, linear-oblong to elliptic, sometimes retuse, about ⅓ in. long; stipules lanceolate: fls. purple, in a short spike. Minn. south and west.

hypoglottis. To 6 in., ascending, from a straggling rootstock: lfts. to 19 and more, oblong or narrower, ½ in. or less long, obtuse; stipules broad and connate: fls. blue-purple, in spikes 1 in. long. Eu.—The plant cult. under this name may be *A. goniatus.*

mexicanus (*Geoprumnon mexicanum*). Per., spreading or decumbent: lfts. to ½ in. long: fls. yellowish-white tipped with blue, in short racemes. Ill. to Tex.

pictus: *A. ceramicus.*

Shortianus (*Xylophacos Shortianus*). Per., st. to 4 in. long: lfts. to 1 in. long: fls. blue or violet, in short racemes. Neb. to Wyo. and Ariz.

utahensis (*Xylophacos utahensis*). Per., st. to 4 in. long: lfts. to ⅓ in. long: fls. violet or purple, in dense racemes. Mont., Wyo., Utah.

ASTRANTIA. MASTERWORT. *Umbelliferæ.* Herbs with palmately lobed or dissected lvs., indifferent small polygamous fls. in umbels which have leafy involucres, and nearly cylindrical frs.; a few species are sometimes planted in borders for variety. Propagated by seeds and division.

carniolica. Per., similar to *A. major* but only 1 ft. high and the bracts subtending the umbels much shorter than fls. Eu.

gracilis. Per. to 8 in.: lvs. 5-parted: fls. whitish, the umbels subtended by whitish bracts. Eu.

major. Per. to 3 ft.: lvs. mostly basal, with 3–5 deep toothed lobes: fls. pinkish, rose or white, the umbels subtended by showy bracts which are longer than fls. and are often tinged purplish. Eu.

ASTRAPÆA: *Dombeya.*

ASTROCARYUM. *Palmaceæ.* More than 30 species of strongly armed monœcious feather-palms from Mex. to Brazil, the infl.

among the lvs., acaulescent to rather tall trees, trunk solitary or plant soboliferous: lvs. with more or less spiny petiole and rachis; pinnæ acuminate or obliquely truncate, mostly plicate, white or much lighter colored underneath, margins aculeate: spadix rather closely or simply branched; staminate fls. in dense spikes at end of branches, pistillate few and below: fr. drupe-like, oblong, ovoid, obovoid or globose, often aculeate, 1-seeded. See *Palm.*

mexicanum. To 12 ft. or more, thickly covered with flat black spines: lvs. 4–6 ft. long, petiole and rachis spiny; pinnæ white underneath, acute but notched at apex, upper ones more or less confluent, margins aculeate: fr. fusiform, about 2 in. long, very spiny. Veracruz, Mex.—Probably planted in S. Fla.

ASTROPHYTUM. Star Cactus. *Cactaceæ.* A few small Mexican species with condensed, cylindric, globular or flattened body and a few prominent ribs or wings that often give it a star-like shape: spines weak or wanting: fls. large, reddish with yellow center, soon fading, borne on the top of the plant. Treatment as for Echinocactus. See *Cacti.*

capricorne (*Echinocactus capricornis*). Plant somewhat globose to nearly cylindric, to 8 and 10 in. high, ribs 7 or 8, spines several, to 2 in. long: fls. about 2½ in. long, spreading wide open, lemon-yellow at center and orange in bottom.

myriostigma (*Echinocactus myriostigma*). Bishops-Hood. Plant globose or cylindric, about 2 in. high, ribs mostly 5, spines absent: fls. about 2 in. long, outer segms. with brown tips.

ornatum (*Echinocactus ornatus*). Plant nearly globose to cylindric, to 1 ft. or more high, white-floccose, ribs 8, spines several or many and about 1 in. long and sharp: fls. lemon-yellow, to 3½ in. broad.

ASYSTASIA. *Acanthaceæ.* Herbs or shrubs native in tropics of Old World, with opposite entire lvs. and tubular 5-lobed fls. in terminal racemes, spikes or panicles; one species grown as a ground-cover in S. Fla. and the tropics.

bella: *Mackaya bella.*

coromandeliana (*A. gangetica*). Procumbent or clambering per. to 4 ft. and more: lvs. ovate, to 3 in. long: fls. purple to yellow or white, 1 in. or more long, in racemes to 6 in. long. Malaya to Afr.; nat. in W. Indies, clambering in bushes and on fences.

gangetica: *A. coromandeliana.*

ATALANTIA. *Rutaceæ.* Trees or shrubs native from India to Australia, sometimes grown as a proposed stock for citrus fruits and for interest, having simple lvs. and petioles jointed at base of lf., 3–5-celled ovary, and fr. resembling a small orange. For cult. see *Citrus Fruits.*

buxifolia: *Severinia buxifolia.*

citroides. Small spiny tree: lvs. oval, emarginate: fr. about ¾ in. across, with glandular skin and pulp-vesicles. Indo-China.

ATAMOSCO: *Zephyranthes.*

ATHAMANTA. *Umbelliferæ.* Per. herbs from the Medit. region and Asia: lvs. pinnately parted: fls. white, in umbels subtended by linear involucral bracts: frs. linear, cylindrical and hairy.

Matthioli. To 10 in.: lf.-segms. thread-like: rays of umbel 20–25, woolly. S. E. Eu.

ATHANASIA ANNUA: *Lonas inodora.*

ATHROTAXIS. *Pinaceæ.* Large densely branched evergreen trees, of 3 species in Tasmania, allied to Cryptomeria, with small scale-like or lanceolate lvs. and small woody globose cones. Sometimes grown in warm climates, as Calif.; cult. under *Conifers.*

cupressoides. Lvs. rhombic-ovate, to ⅙ in. long, obtuse: cones to ½ in. across.

laxifolia. Lvs. ovate- lanceolate, ¼ in. long, acute or obtuse: cones ¾ in. across.

selaginoides. Lvs. lanceolate, to ½ in. long, spiny-pointed: cones to 1 in. across.

ATHYRIUM. *Polypodiaceæ.* Foliage similar to that of Asplenium, with which genus they have been united, the distinguishing characteristic being in the shape and position of the fruit-dots; widely distributed, mostly in the tropics, a few cult. See *Ferns.*

acrostichoides (*A. thelypteroides. Asplenium acrostichoides* and *thelypteroides*). Lvs. to 3 ft. long, deeply bipinnatifid, segms. toothed, on long straw-colored stalks. N. S. to Ga. and Mo.

angustifolium (*A. pycnocarpon. Asplenium angustifolium* and *pycnocarpon*). Lvs. to 2½ ft. long, simply pinnate, the segms. to 5 in. long, nearly entire. Que. to Ga. and Mo.

cyclosorum: *A. Filix-femina.*

Filix-femina (*A. cyclosorum. Asplenium Filix-femina*). Lady-Fern. Hardy, bright green: lvs. to 3 ft. long, bipinnate, segms, deeply toothed or cut. Eu., Asia, W. N. Amer.—The E. American plants represent two species or varieties (*A. angustum* and *A. asplenioides*) differing in technical characters. Some of the hort. vars. derived from the European type are **Craigii,** dwarf and crested, **crispum, Frizelliæ, grandiceps, laciniatum, latifolium, multifidum, plumosum, pulcherrimum, setigerum, Victoriæ** with pinnæ forked to base and crested at tips.

Goeringianum (*Asplenium Goeringianum*). Hardy: lvs. deciduous, usually drooping, to 1½ ft. long, pinnate, the segms, toothed or cut. Japan. Var. **pictum** has stalks purplish, lvs. with central gray band.

pycnocarpon: *A. angustifolium.*

thelypteroides: *A. acrostichoides.*

ATRAGENE AMERICANA: *Clematis verticillaris.*

ATRAPHAXIS. *Polygonaceæ.* Deciduous subshrubs with small lvs., white or pinkish fls. in terminal racemes, and fr. an achene; native in Asia, Greece, N. Afr.

They thrive on rather dry soil in sunny positions. Propagated by seeds in spring, by layers, and by cuttings of young wood in early summer under glass.

frutescens (*A. lanceolata*). To 3 ft.: lvs. oblong to lanceolate, to 1¼ in. long, grayish-green: fls. whitish, in racemes to 3 in. long, Aug.–Sept. S. Russia to Cent. Asia; hardy far N.

lanceolata: *A. frutescens.*

ATRIPLEX. Saltbush. *Chenopodiaceæ.* Mealy or scurfy herbs or shrubs with alternate or opposite lvs. and small greenish unisexual fls. in clusters; often native in salty situations.

One species, the orach, is grown for greens. Seeds are sown in drills in early spring and the seedlings thinned out in the row. Others are grown for ornament and as forage plants in desert regions.

Breweri. Shrub to 6 ft.: lvs. ovate-oblong, silvery-gray, to 1½ in. long. S. Calif.—Planted for hedges.

Halimus. Shrub to 6 ft.: lvs. broad-ovate or ovate-oblong, to 2½ in. long, silvery. S. Eu.

hortensis. Orach. Ann. to 6 ft.: lvs, triangular-ovate or arrow-shaped, the margins toothed or wavy, varying in color from pale yellowish-green to dark red. Asia.

lentiformis. Quail-Bush. Shrub to 10 ft.: lvs. ovate or arrow-shaped, silvery, to 1½ in. long. Calif., Ariz.

semibaccata. Diffuse or spreading grayish per. to 3 ft.: lvs. oblong, to 2 in. long, toothed or entire. Australia; nat. in Calif. and Ariz.—Forage plant.

ATROPA. *Solanaceæ.* A few Old World herbs, one economically important as the source of atropine and other drugs: lvs. alternate, entire: fls. bell- or funnel-shaped: berries purple, poisonous, in an enlarged calyx.

Belladonna. BELLADONNA. Per. to 3 ft.: lvs. ovate, to 6 in. long: fls. blue-purple or dull red, about 1 in. long, solitary or in pairs, nodding, axillary: berry nearly globular, ½ in. long, shining black. Eu., Asia.

ATTALEA. *Palmaceæ.* Unarmed feather-palms, probably 25 species Mex. to Brazil, monœcious or diœcious, trunk (if any) single and usually very large, ringed, sometimes lofty: lvs. long and heavy, gracefully outcurving at the end, pinnæ often standing edgewise: spadices erect among the lvs., on long peduncles, the 2 spathe-lvs. usually strong and durable; when monœcious, the staminate fls. on upper part of branches; stamens usually 10–24, large: fr. nut-like, to 3½ in. long, bearing a prominent beak, the covering fibrous. Palms sometimes planted as Attalea may belong to the related genus Scheelea of the Amer. tropics, which differs in having 6 stamens and other technical differences. For cult. see *Palm.*

Cohune. Ponderous palm reaching 50 ft. and more: lvs. often 20 ft. and more long, with very many long stiffish more or less conduplicate pinnæ: spadix 4–6 ft. long: fr. about 3 in. long, ovoid-oblong. Mex., Cent. Amer.; stands in the open in S. Fla.

gomphococca. To 30 ft.: lvs. 6–9 ft. long; pinnæ very many and narrow, pale underneath; petiole very short and fibrous at base. Costa Rica.

AUBRIETA. *Cruciferæ.* Choice little mat-forming perennials prized for the abundant bright purple or lilac spring bloom: pods or silicles short-oblong to globose. The several forms commonly known in cult. are color-races or varieties of **A. deltoidea,** which is native in Italy and Greece to Asia Minor. Named varieties are *Bouganvillei, Campbelli, Eyrei, græca, Hendersonii, hybrida, Leichtlini, Moerheimi, olympica, purpurea.* The fl.-sts. rise 2 in. to 10 or 12 in. The attractive deltoid or rhomboidal foliage covers spaces well between rocks and along borders. Propagation is by seeds, sown a season in advance of blooming, by division of the mats or clumps, and by layers of the trailing shoots. Aubrietas thrive well in usual half-shady exposures. —The name was originally spelled *Aubrieta,* not *Aubrietia.*

AUCUBA. *Cornaceæ.* Evergreen shrubs native in Asia, with opposite simple lvs., small purple diœcious fls. in terminal panicles, and fr. a berry-like drupe. The name is sometimes but was not originally spelled Aukuba.

Aucubas are grown in a cool greenhouse and out-of-doors in mild climates for the ornamental foliage. They thrive in a partially shaded position in moist well-drained soil. Propagated by cuttings of half-ripened wood, seeds, or the varieties by grafting.

crotonifolia. Lvs. croton-like, green spotted with white. Probably a var. of *A. japonica.*

himalaica. To 15 ft.: lvs. lanceolate or broader, to 8 in. long, finely toothed: fr. orange to scarlet. Himalayas; to be planted only far S.

japonica. To 15 ft.: lvs. dark green and shining, ovate or oblong, to 7 in. long, coarsely toothed above middle: fr. scarlet, rarely yellow or white. Himalayas to Japan; hardy in D. C. Var. **variegata** (var. *maculata*), GOLD-DUST TREE, has yellow-spotted lvs. Var. **latimaculata** (var. *aureo-maculata*) has a large yellow blotch in center of lf. Var. **dentata** has smaller coarsely toothed lvs. Var. **longifolia** (var. *angustifolia*), narrow lvs. to 5 in. long. Var. **macrophylla,** large broad lvs.

serratifolia is a form of *A. japonica.*

AUDIBERTIA (*Ramona*). *Labiatæ.* Herbs or subshrubs grown for ornament and for bees: per.: lvs. usually rugose and sage-like: fls. axillary or terminal, 2-lipped, differing from Salvia in the spathe-like calyx, blooming in spring and summer. They require the usual cult. for perennials.

grandiflora (*Salvia spathacea*). CRIMSON SAGE. Per. to 3 ft.: lvs. white-tomentose beneath: fls. to 1½ in. long, crimson, in dense clusters. Calif.

nivea (*Salvia leucophylla*). PURPLE SAGE. To 4 ft., the sts. woody, white-tomentose: fls. light purple, ½ in. long. Calif.

polystachya (*Salvia apiana*). WHITE SAGE. To 10 ft., shrubby, white-tomentose: fls. white, to ¾ in. long. Calif.—One of the shrubs called "greasewood."

stachyoides (*Salvia mellifera*). BLACK SAGE. Stiff and shrubby, 3 ft. high: lvs. green above, gray-tomentose beneath: fls. white or lilac-tinged, ½ in. long. Calif.—A bee plant.

AUDOUINIA. *Bruniaceæ.* One heath-like shrub in S. Afr., **A. capitata** (*Diosma capitata*), suitable for Calif. and under glass, with treatment as for Diosma: to 2 ft., branches erect and more or less whorled: lvs. small and sessile, linear, imbricate: fls. crimson, in long spike-like terminal crowded heads.

AULIZA: *Epidendrum ciliare.*

AUREOLARIA. *Scrophulariaceæ.* N. American herbs parasitic on the roots of Quercus, with entire or bipinnatifid lvs. and yellow fls. with spreading lobes, on axillary peduncles or in a terminal leafy raceme or panicle; sometimes transferred from the wild.

pedicularia (*Gerardia* and *Dasystoma pedicularia*). Ann. or bien. to 4 ft.: lvs. pinnatifid two-thirds to midrib: corolla to 1½ in. long, pubescent outside, with spreading lobes, Aug.–Sept. Me. to Fla. and Mo.

AURICLE: an ear-shaped part or appendage, as the projections at the base of some leaves and petals.

AURICULA. A favorite spring cool-season perennial of European fanciers, little grown in North America. It is *Primula Auricula* (which see), in many forms and colors, but some of the races may be of hybrid origin with other species. It is grown mostly in pots or boxes under frames; propagation is by seeds in general and for the production of new varieties, and by offsets or division for the perpetuation of particular varieties. Seeds sown in early spring should give blooming plants the following spring, but some of the seeds may not germinate until the second year. In the North plants may be carried over winter in a cold greenhouse.

AVENA. OATS. *Gramineæ.* Mostly ann. grasses, having flat lvs. and long-pointed mostly awned and hanging spikelets in loose panicles; native in temp. regions of the world and grown for the grain, forage, hay and occasionally for ornament. The panicles may hang in all directions (all-sided) or to one side only. They are sown in early spring or sometimes in autumn in mild climates. See *Grasses.*

barbata. Slender Wild Oat. Differing from *A. fatua* in the more slender panicles and in tecnhical characters of the florets. Eu.; nat. on Pacific Coast.

brevis. To 3 ft.: panicle one-sided; spikelets with 2 awns; oat short and broad. Eu.

elatior: *Arrhenatherum elatius.*

fatua. Wild Oat. To 4 ft., tufted: lvs. to 8 in. long and ⅓ in. wide: panicles to 1 ft. long, all-sided, the spikelets drooping and with awns to 1½ in. long. Eu., Asia; nat. in N. Amer.

flavescens: *Trisetum flavescens.*

nuda. Naked Oat. Differs from *A. sativa* in the grain separating from the hull; panicle close. Probably cultigen.

sativa. Common Oat. To 4 ft., tufted: lvs. to 1 ft. long and ½ in. wide: panicles to 1 ft. long, the branches all-sided or from one side in the forms known as Side Oats, awns to ¾ in. long or lacking; grain of fr. permanently inclosed in hull. Cultigen.

sterilis. Animated Oat. To 3 ft.: panicles to 1 ft. long, awns to 2 in. or more long and twisted, the florets moving by hygroscopic action. Medit. region.—Much of the seed planted under this name is *A. fatua.*

strigosa. Much like *A. sativa* but differing in technical floral characters: spikelets prickle-pointed. Eu.

AVENS: *Geum.*

AVERRHOA. *Oxalidaceæ.* Evergreen trees with alternate pinnate lvs., small fragrant fls., and large fleshy berry-like edible fr.; trop. Asia.

They can be grown only in regions free from frost, and thrive on deep rich soil in a moist climate. Propagated by seeds or by budding.

Bilimbi. Bilimbi. To 50 ft.: lfts. 24–45: fls. red-purple: fr. greenish-yellow, to 4 in. long, with 5 obscure angles. Known only in cult.

Carambola. Carambola. To 30 ft.: lfts. 5–9: fls. white marked with purple: fr. yellow or golden-brown, to 5 in. long, with deep ribs. Malayan region and spread in tropics.

AVIGNON BERRY: *Rhamnus infectoria.*

AVOCADO. The large pear-shaped or oblong or nearly globular fruit of *Persea americana* (which see), a tropical or subtropical American evergreen broad-leaved tree; other species may be involved in the origin of them.

The avocado has become of great importance in southern California and southern Florida as a market fruit and a special literature has developed. It is grown in orchard plantings, the trees standing 20–25 feet apart either way, on well-drained fertile open land. The tree reaches a height of 30 feet or more. Transplanting is commonly undertaken in spring and early summer, a ball of earth being removed with the tree; the plant is preferably banked in moist shavings in a lath house for at least two weeks, with daily syringing before being planted in the orchard. In two or three years most varieties begin to bear.

Named varieties are propagated on seedling avocado stocks by shield-budding in autumn or spring, the former perhaps preferable. The stock should be in active growth with the soil fairly wet. Skill is required in choosing budwood at just the proper stage of maturity so that the "eyes" will not fail. Rubber bands are employed to hold the bud in place, but most growers still use waxed cloth. The stock is cut back gradually, not all of it being removed until the bud has made a growth of 2 feet or so; the cut is then shellacked.

When packed for shipment the fruit is not wrapped in paper but is nested in excelsior in well-ventilated small crates. In California Fuerte (December to July) is the leading commercial variety. Nabal, Taft, Queen are excellent summer and autumn varieties. Yield varies widely from year to year, depending largely on weather conditions at blooming time which is March and April. Averaging over several years, 150 pounds to a tree is considered a conservative estimate for trees ten years old and over.

The avocado varieties are of several groups, as West Indian, Guatemalan, Mexican. The first comprises the tenderest varieties and can be grown only in the warmer parts of Florida. These kinds, as Trapp, Pollock, Simonds, ripen late summer to early winter. The Guatemalans, represented by Fuerte, Taft, Taylor, Wagner, are hardier and can be grown in central peninsular Florida; they ripen from early winter to spring. The Mexican group is about as hardy as the sweet orange, in the varieties Tarmon, Puebla, San Sebastian, Northrop, Gottfried; June to October.

AWL-SHAPED: narrow and sharp-pointed; gradually tapering from base to a slender or stiff point.

AWN: a bristle-like part or appendage.

AXIL: upper angle that a petiole or peduncle makes with the stem that bears it.

AXONOPUS. *Gramineæ.* Ann. and per. grasses of warm regions, having flat lvs. and small spikelets borne in narrow one-sided spike-like racemes; one species is grown in pastures in the S. See *Grasses.*

compressus (*Anastrophus compressus*). Carpet-Grass. Per. to 2 ft., stoloniferous: lvs. to 4 in. long and ¼ in. wide: racemes to 2 in. long, in clusters of 2–5 toward top of sts. Va. to La., trop. Amer.

AZADIRACHTA. *Meliaceæ.* Probably not planted here outside test grounds: see *Melia.*

AZALEA: *Rhododendron.* **Alpine-:** *Loiseleuria.*

AZALEASTRUM: *Rhododendron arborescens.*

AZARA. *Flacourtiaceæ.* Evergreen trees and shrubs native in S. Amer., with alternate simple lvs., small fragrant fls. in axillary racemes and clusters, and fr. a berry.

Grown for ornament in warm regions and sometimes under glass. Propagated by seeds or ripened cuttings.

celastrina. Much branched shrub to 9 ft.: lvs. round-oval, to 1½ in. long, slightly toothed, shining above: fls. golden-yellow, densely tomentose. Chile.

Gilliesii. To 15 ft.: lvs. broad-ovate, to 3 in. long, with coarse spiny teeth: fls. yellow. Chile.

integrifolia. To 20 ft.: lvs. obovate or oblong, to 1½ in. long, entire: fls. yellow, in racemes. Chile.

microphylla. To 12 ft.: lvs. obovate, to ¾ in. long: fls. greenish: fr. orange. Chile.

AZAROLE: *Cratægus Azarolus.*

AZOLLA. *Salviniaceæ.* Moss-like floating plants, with pinnately divided leaf-like sts. and minute lvs.; widely scattered.

caroliniana. Plants about 1 in. long, greenish or reddish. N. Amer., trop. Amer.—Sometimes grown on the surface of aquaria and greenhouse tanks.

B

BABIANA. *Iridaceæ.* Low cormous herbs from S. Afr., the st. bearing several plicate lvs. and lilac, yellow, pink or red fls. in terminal clusters or racemes, the perianth with slender tube and equal segms. Sometimes grown in pots under glass or in the open in mild climates for spring bloom. Propagated by cormels and seeds.

stricta. To 1 ft.: lvs. sword-shaped, hairy: fls. red or lilac, to 1½ in. long, the bracts hairy.

BABY BLUE-EYES: *Nemophila insignis.*

BABYS-BREATH: *Gypsophila paniculata.* **False:** *Galium Mollugo.*

BACCHARIS. *Compositæ.* Shrubs with small white or yellowish diœcious heads in corymbs or panicles; florets all tubular; pappus of the fr. snow-white and showy: lvs. alternate, sometimes evergreen.

The species are sometimes transferred to grounds for their more or less persistent foliage, or the profuse white or yellowish bloom; *B. halimifolia* is valuable for seashore planting. Some of them require well-drained soil and a sunny position, and others are marsh plants. Propagated easily both by seed and by cuttings rooted under glass.

angustifolia. To 8 ft.: lvs. linear, to 3 in. long, nearly entire, leathery. N. C. to Fla. and Tex., in brackish marshes.

Douglasii. To 5 ft., sticky: lvs. lanceolate, to 4 in. long, nearly entire. Calif., in lowlands.

genistelloides. To 2½ ft.: lvs. very small and bract-like or scale-like, borne on prominently winged leaf-like branches. Peru, Brazil.

glomeruliflora. To 10 ft.: lvs. spatulate, to 2 in. long, toothed above middle or entire, leathery and light green. N. C. to Fla., swamps and lowlands.

halimifolia. GROUNDSEL-BUSH. To 12 ft.: lvs. oblong or obovate, to 3 in. long, coarsely toothed, the upper entire. Mass. to Fla. and Tex., along the coast and in marshes.

pilularis. To 5 ft., evergreen: lvs. obovate, to 1 in. long, few-toothed or entire. Calif., Ore., on hills and dunes.

BACHELORS-BUTTON: *Centaurea Cyanus.*

BACTRIS. *Palmaceæ.* Feather-lvd. monœcious mostly gregarious palms of many species in trop. Amer., rarely planted and little known in the U. S.: mostly lowland and swamp plants, armed with spines and prickles: spadices among the lvs., short, covered by one of the spiny spathes; staminate fls. on upper part of branches; stamens 6–12: fr. globose and drupe-like, 1 in. more or less diam. For cult. see *Palm.*

Gasipaes: *Guilielma Gasipaes.*

major (*Pyrenoglyphis major*). Sts. in an attractive clump, to 15 ft., armed with rows of black spines, as are the petioles and rachises: lvs. 4–6 ft. long; pinnæ linear, about 30 pairs, 8–12 in. long, ½ in. or less broad, setose on margin: fr. about 1½ in. long, purplish-black. N. S. Amer.

BAEL FRUIT: *Ægle Marmelos.*

BAERIA. GOLDFIELDS. *Compositæ.* California, mostly annuals with opposite lvs. and many-fld. yellow heads of ray- and disk-fls.; pappus of scales or awns or lacking. Grown in the flower-garden for spring and summer bloom, and propagated by seeds.

aristata (*Actinolepis* and *B. coronaria. Hymenoxys californica. Shortia californica*). Sts. weak, to 10 in. long: lvs. 1–2-pinnate into linear segms.: heads ½ in. across.—Used for edgings and as an everlasting.

chrysostoma (*B. gracilis*). Much branched, 4–12 in. high: lvs. linear to thread-like, entire: heads to 1 in. across.

coronaria: *B. aristata.*

gracilis: *B. chrysostoma.*

macrantha. Sts. simple or nearly so, to 2 ft., from horizontal tuberous per. roots: lvs. linear, entire, to 5 in. or more long, ciliate and toothed: fls. to 1 in. across, slender-pedicelled. Calif.—Variable.

BAILLONIA. *Verbenaceæ.* Two S. American deciduous woody plants with opposite or whorled sessile lvs. and somewhat 2-lipped fls. in racemes or spikes, the corolla 5-lobed: fr. a drupe in the persisting calyx. Adapted to Calif. and under glass.

juncea (*Diostea juncea*). Small tree or shrub to 20 ft. with rush-like branches and small opposite remote dentate lvs.: fls. lilac, in short dense spikes, the corolla ¼–⅓ in. long. Chile, Peru.

BALAKA. *Palmaceæ.* Segregate from Ptychosperma and by many botanists retained in that genus: differs in the very broad or half-rhomboid pinnæ and not furrowed seed and albumen not ruminate; 2 species in Fiji; polygamo-diœcious small palms adapted to house cult. and probably in the open in S. Fla. For cult. see *Palm.*

perbrevis (*Kentia Kersteniana*). Interesting small unarmed palm with slender solitary ringed trunk and gracefully spreading and arching dark green lvs.: pinnæ 6–10 in. long, 2–3 in. broad at apex and thence narrowed to base (sometimes with very narrow ones intermixed), the end irregularly jagged and truncate or concave, with a projecting point at either side in young lvs. and the upper point often 2–3 in. long, with prominent midrib and thick margins and many intermediate veins; rachis somewhat scurfy.—*Kentia præmorsa* of the trade is probably this species.

Seemannii (*Ptychosperma Seemannii*). Very slender woods palm to 12 ft. and an in. or so diam., straight and ringed: lvs. to 4 ft. long; pinnæ or segms. broad and toothed-erose at apex and oblique, upper margin longer, about 9–14 in number: spadix below the lvs., with several slender branches, fls. distichous.

BALAUSTION. *Myrtaceæ.* One shrub native in W. Australia, with decumbent or prostrate sts. to 1 ft. long. **B. pulcherrimum.** Lvs. opposite, linear, to ½ in. long, keeled or 3-angled, stiff, entire: fls. red, solitary in axils, petals about ½ in. across.

BALISIER: *Heliconia Bihai.*

BALLOON-BERRY: see *Rubus illecebrosus.* **-Flower:** *Platycodon grandiflorum.* **-Vine:** *Cardiospermum Halicacabum.*

BALLOTA. *Labiatæ.* Pubescent per. herbs or subshrubs with toothed lvs. and small 2-lipped fls. in axillary clusters; native in the Old World and sometimes planted for ornament. Of simple requirements.

fœtida. Similar to *B. nigra* and perhaps a form of it, very ill-scented. Medit. region.

nigra. Black Hoarhound. To 3 ft.: lvs. ovate, to 2 in. long: fls. reddish-purple or whitish, to ¾ in. long. Eu.; nat. in E. N. Amer.

BALM: *Melissa.* **Bee-:** *Monarda didyma.* **Canary-:** *Cedronella canariensis.* **Field-:** *Nepeta hederacea.* **Fragrant-:** *Monarda didyma.* **Horse-:** *Collinsonia.* **Molucca-:** *Molucella lævis.* **-of-Gilead:** *Populus candicans.*

BALSA: *Ochroma*; see under *Bombacaceæ.*

BALSAM, Garden: *Impatiens Balsamina.* **-of-Peru:** *Myroxylon Pereiræ.* **-Root:** *Balsamorhiza.* **-Tree:** *Myroxylon.*

BALSAMINACEÆ. Balsam Family. Two genera; one widely distributed, of ann. and per. succulent herbs with simple lvs., very irregular bisexual fls. having 3 sepals one of which is large and petal-like, 5 unequal petals or 2 pairs united forming 3 petals, 5 stamens, 5-celled ovary, and fr. a caps. or berry. The genus Impatiens is grown for ornament, the other genus, Hydrocera, with a single species from Ceylon to Java, not being in cult.

BALSAMOCITRUS. *Rutaceæ.* A few African usually spiny trees with mostly 3-foliolate lvs., sometimes grown for interest and as possible stocks for citrus fruits: stamens 10–20: fr. large and hard-shelled and often persistent. **B. Dawei** reaches 50–60 ft.: mature lvs. with 3 lance-ovate stalked lfts.: fr. 4–6 in. diam., globose or nearly so, 8-celled, dropping from the pedicel when ripe.

BALSAMORHIZA. Balsam-Root. *Compositæ.* Low per. herbs with thick roots, large mostly basal lvs. and few or solitary showy yellow heads of ray- and disk-fls.; pappus none; native in W. Amer. on mts., foot-hills and sandy regions, and sometimes planted for ornament; spring and summer bloomers.

hirsuta. To 2 ft., hairy: lvs. pinnately divided into toothed or cut segms.: heads to 1¾ in. across. B. C. to Calif. and Utah.

macrophylla. To 2 ft., hairy: lvs. pinnately divided into entire segms.: heads to 3½ in. across. Utah, Wyo.

sagittata. To 2 ft.: lvs. cordate to sagittate, to 8 in. long, nearly entire, white-tomentose: heads 2 in. or more across. B. C. to Calif. and Colo.

BAMBOO. *Gramineæ.* Various giant long-lived woody grasses, mostly of the genera Arundinaria, Bambusa, Cephalostachyum, Chusquea, Dendrocalamus, Phyllostachys, Sasa, Thamnocalamus, as known in this country. The species of these genera are mostly Asian, but some of the Arundinarias are plants of the western hemisphere, two of them being native as far north as Missouri and Maryland. A few of them, as Chusqueas, are climbers.

The bamboos are adapted only to the southern parts of the country, although certain small kinds are hardy as far as Philadelphia or even northward. They usually do not produce seed in this country, and propagation is by division of the clumps and cuttings of the stolons. Bamboos require fertile soil and a uniform supply of clean underground water, and some of them thrive along water-courses. With age and thorough establishing of the roots, the clumps become conspicuous or even commanding objects. The larger kinds make good shelter-belts and groves.

BAMBUSA. Bamboo. *Gramineæ.* Tall woody grasses, sometimes climbing, with cylindrical hollow sts., persistent lf.-sheaths, and spikelets borne in panicles, stamens 6; native mostly in tropics of Old World and not hardy in northern states. See *Bamboo.*

Alphonse Karri: *B. nana* var.

angulata (*B.* and *Arundunaria quadrangularis*). To 3 ft., st. 4-angled: lvs. to 7 in. long and 1 in. wide, hairy beneath. China.

angustifolia: *Sasa disticha.*

argenteo-striata: *Sasa argenteo-striata.*

arundinacea. To 100 ft., culms yellow, branches flexuose and spiny: lvs. to 8 in. long and ½ in. wide, nearly glabrous: infl. a large panicle produced only once after which the plant dies. India.

aurea: *Phyllostachys aurea.*

aureo-striata: *Sasa aureo-striata.*

Castillonis: *Phyllostachys reticulata* var.

chrysantha: *Sasa chrysantha.*

disticha: *Sasa disticha.*

falcata: *Arundinaria falcata.*

fastuosa: *Arundinaria fastuosa.*

flexuosa: *Phyllostachys flexuosa.*

Fortunei aurea: *Sasa auricoma.*

gracilis: *Thamnocalamus Hindsii.*

Henonis: *Phyllostachys puberula.*

japonica: *Sasa japonica.*

kumasaca: *Phyllostachys kumasasa.*

Laydeckeri: *Arundinaria Simoni* var. *Chino.*

marmorea: *Arundinaria marmorea.*

Metake: *Sasa japonica.*

mitis: *Phyllostachys mitis.*

nana. To 10 ft., sts. yellow: lvs. to 3 in. long and ¼ in. wide, rough on edges, glaucous-blue. China, Japan. Var. **Alphonse Karri** (*B. Alphonse Karri*) has sts. variegated yellow and green, lvs. mottled rose and green. Var. **variegata** (*B. vittata-argentea*) has lvs. mottled with silvery-white.—Much of the material cult. as *B. nana* is *Sasa disticha.*

nigra: *Phyllostachys nigra.*

nutans. To 45 ft., the culms glossy-green: lvs. to 1 ft. long and 1 in. wide, rough above and on edges, glabrous or hairy beneath. India.

palmata: *Sasa senanensis* var. *nebulosa.*

quadrangularis: *B. angulata.*

Ragamowskii: *Sasa tessellata.*

Simoni: *Arundinaria Simoni.*

striata: *Phyllostachys sulphurea.*

sulphurea: *Phyllostachys sulphurea.*

tessellata: *Sasa tessellata.*

Thouarsii: *B. vulgaris.*

Tulda. To 70 ft., the culms gray-green: lvs. to 13 in. long and 1½ in. wide, rough above and on edges, paler and usually hairy beneath. India.

Veitchii: *Sasa Veitchii.*

verticillata: a name of doubtful botanical application.

Vilmorini: *Sasa disticha.*

viminalis: *Phyllostachys kumasasa.*

violescens: *Phyllostachys violescens.*

viridi-glaucescens: *Phyllostachys viridi-glaucescens.*

viridi-striata: *Sasa auricoma.*

vittata-argentea: *B. nana* var. *variegata.*

vulgaris (*B. Thouarsii*). Feathery B. To 50 ft., with yellow longitudinally banded sts.: lvs. to 10 in. long and 1½ in. wide, glabrous. Java and perhaps elsewhere.

BANANA. A tropical fruit extensively grown for local use and for export to temperate regions. It is a perennial herb but the stem and leaf-sheaths produce a trunk-like structure and the plant may attain a height of 20–30 feet with a crown of big long leaves and a heavy cluster of fruits. The common species is of two main races (sometimes regarded as two species), *Musa paradisiaca*, the plantain of which the fruit is edible when cooked, and var. *sapientum*, the true banana which is edible raw at maturity. Another species is the dwarf or Chinese banana, *Musa Cavendishii*, which may be grown commercially in warm-temperate climates, as in Bermuda and the Canaries. See *Musa*.

The banana bears once and then the main stalk or trunk dies or becomes weak; in the meantime suckers (one or more) have arisen from the crown to continue the fruiting. A vigorous sprout or new trunk should bear in ten or twelve months (or later than that if the plant is grown for curiosity under cover). A plantation continues to bear for several years if diseases, insects and soil defects do not intervene.

Propagation is by means of suckers inasmuch as commercial bananas are seedless. Dwarf bananas (*M. Cavendishii*) may be set as close as 8 or 10 feet either way, but the ordinary large kinds should stand 14 to 20 feet apart in commercial plantations. The banana requires moist deep and fertile soil but well drained, and protection from wind and full burning sun. Surplus suckers are removed to increase the vigor of the bearing stands.

Within the continental United States the banana is infrequently a commercial fruit except the dwarf Chinese, although it is commonly planted for home use, ornament and interest in Florida, along the Gulf Coast and elsewhere. The fruit is destroyed by frost, but new shoots arise from the crowns if the freezing is not too severe.

BANANA-SHRUB: *Michelia fuscata.*

BANEBERRY: *Actæa.*

BANGALAY: *Eucalyptus botryoides.*

BANKSIA. *Proteaceæ.* Australian evergreen trees or shrubs with alternate lvs. and yellowish fls. borne in pairs in dense terminal spikes becoming woody and cone-like in fr.; sometimes grown in S. U. S. Propagated by cuttings under a bell-jar or with difficulty by seeds. See also *Pimelea.*

Baxteri. Tall shrub: lvs. to 4 in. long, divided to midrib into triangular lobes 1 in. long and ¾ in. wide at base, pale beneath: spikes globular, to 3 in. across. W. Australia.

Caleyi. Low shrub: lvs. oblong-lanceolate, to 6 in. long, prickly-toothed or cut: spikes nearly globular, to 3 in. long. W. Australia.

coccinea. Shrub to 15 ft.: lvs. obovate to orbicular, to 2½ in. long, stiff, prickly-toothed: spikes globular, 2 in. across. W. Australia.

collina. Shrub to 12 ft.: lvs. linear, to 3 in. or more long, sharply toothed, white-tomentose beneath: spikes to 6 in. long.

ericæfolia. Shrub or tree to 14 ft.: lvs. narrowly linear, about ½ in. long, with entire revolute margins, notched or truncate at end: spikes to 10 in. long. New S. Wales.

grandis. Tree to 40 ft.: lvs. to 1 ft. long, divided to midrib into triangular lobes to 2 in. long and 1 in. wide at base, pale and tomentose beneath: spikes to 1 ft. long. W. Australia.

integrifolia. Tree to 30 ft.: lvs. scattered, oblong to lanceolate, to 8 in. long and 1 in. wide, entire or sometimes toothed, white-tomentose beneath: spikes to 6 in. long.

littoralis. Tree to 40 ft.: lvs. linear, to 8 in. long, usually toothed, white-tomentose beneath: spikes to 10 in. long. W. Australia.

marginata. Shrub to 15 ft.: lvs. oblong-lanceolate, to 2 in. long, usually entire with recurved margins, white beneath: spikes to 3 in. long.

Menziesii. Tree to 40 ft.: lvs. to 1 ft. long and 1 in. wide, truncate, rusty-tomentose beneath: spikes to 5 in. long. W. Australia.

nutans. Shrub: lvs. narrow-linear, to 1 in. long, with entire revolute margins, glabrous: spikes to 2 in. long, sometimes nodding. W. Australia.

occidentalis. Shrub to 5 ft.: lvs. linear, to 4 in. long, notched or toothed at end, margins recurved, white beneath: spikes to 6 in. long. W. Australia.

pulchella. Shrub: lvs. linear, to ½ in. long, with entire revolute margins: spikes to 1½ in. long. W. Australia.

quercifolia. Shrub to 6 ft., glabrous: lvs. oblong, to 4 in. long, truncate, deeply toothed or cut: spikes to 4 in. long. W. Australia.

repens. Prostrate shrub: lvs. to 1 ft. long, long-stalked, deeply pinnatifid, thick and stiff: spikes to 4 in. long. W. Australia.

serrata. Tree to 20 ft.: lvs. oblong-lanceolate, to 6 in. long and 1 in. wide, deeply toothed, tomentose beneath, leathery: spikes to 6 in. long.

sphærocarpa. Shrub to 4 ft., tomentose: lvs. linear, 1–3 in. long, with entire revolute margins: spikes globular, to 3 in. across. W. Australia.

verticillata. Small tree: lvs. in whorls, oblong-lanceolate, to 3 in. long, margins recurved, white beneath: spikes to 8 in. long. W. Australia.

BANYAN: *Ficus benghalensis.*

BAOBAB: *Adansonia digitata.*

BAPHIA (*Bracteolaria*). *Leguminosæ.* Thirty or more simple-lvd. African trees and shrubs, one of which is intro. for ornament in S. Fla.: fls. papilionaceous, in panicles or axillary racemes: pod linear-lanceolate, flattened, narrowed to apex. **B. racemosa**, CAMWOOD, is a shrub, with oblong-lanceolate pointed entire lvs. to 2½ in. long: fls. white with purplish veins, the standard nearly ½ in. across, in short panicled leafy clusters: pods 2 in. long. Trop. and S. Afr.

BAPTISIA. FALSE OR WILD INDIGO. *Leguminosæ.* Per. herbs with mostly digitate lvs. of 3 lfts., papilionaceous fls. in racemes, and short inflated pods; native in E. N. Amer. in dry lands, adapted to borders and wild-gardens. Propagated by division or seeds.

australis. To 6 ft.: lfts. to 2½ in. long; fls. indigo-blue, in summer. Pa. to Ga. and Tex.

bracteata. To 2 ft.: lfts. to 4 in. long: fls. cream-colored, in spring. Ga.

leucantha. To 4 ft.: lfts. to 2 in. long: fls. white, June–July. Ont. to Fla. and Tex.

leucophæa. To 2½ ft.: lfts. to 4 in. long: fls. white or cream-colored, in spring. Mich. to Tex.

perfoliata. To 3 ft.: lvs. simple, orbicular, to 2 in. long, perfoliate: fls. yellow, in spring. Ga., S. C.

tinctoria. To 4 ft.: lfts. to 1 in. long: fls. bright yellow, in summer. Me. to Fla. and La.

BARBADOS FLOWER-FENCE: *Poinciana pulcherrima.* -Nut: *Jatropha Curcas.* Pride: *Poinciana pulcherrima.*

BARBAREA (*Campe*). WINTER-CRESS. UPLAND-CRESS. *Cruciferæ.* A few biennials and perennials in temp. regions, some of them becoming field and roadside weeds, a few kinds more or less grown as edible cress, and sometimes for ornament: they are erect branching herbs with small yellow fls. in terminal racemes, elongated erect or spreading pods or siliques, and pinnatifid or lyrate lvs. See *Cress.*

præcox: *B. verna.*

rupicola. Per., forming mats or sods: st. to 1 ft.: radical lvs. with large cordate terminal segm. or part, cauline pinnatifid: fls. large, the pedicels longer than sepals. Corsica, Sardinia.—Grown for ornament.

verna (*B. præcox*). EARLY or BELLE ISLE CRESS. Bien., probably sometimes per., to 2 ft.: lvs. irregularly pinnatifid, the segms. of the radical ones mostly 4–8 pairs: pod at maturity 1½ in. or more long, sharply 4-angled, on pedicel nearly or quite as thick as itself, the beak or point short and thick. Eu.; sometimes run wild.—Blooms in very early spring.

vulgaris. Per. or perhaps bien. to 2 ft.: lvs. with 1–3 pairs of segms.: pod 1 in. or less long, obtusely angled, on relatively thin pedicels, the beak commonly very thin. Eu.; extensively nat. in N. Amer.—Blooms later. Double-fld. and variegated-lvd. forms are known.

BARBERRY: *Berberis.* **Holly:** *Mahonia Aquifolium.*

BARKERIA: *Epidendrum.*

BARKLYA. *Leguminosæ.* One tree to 60 ft. native of Queensland and intro. in S. Calif. **B. syringifolia.** Lvs. simple, broad-cordate, to 4 in. long: fls. golden-yellow, small, regular, in dense racemes to 9 in. long forming terminal panicles.

BARLERIA. *Acanthaceæ.* Herbs or shrubs with opposite entire lvs. and funnelform 5-lobed fls. solitary or in spikes or heads, with large often showy bracts; native in Old World tropics and grown under glass or in the open in warm climates. Propagated by cuttings of young wood over heat.

cærulea. To 4 ft.: lvs. ovate, to 6 in. and more long: fls. blue, to 2 in. long, in dense spikes to 3 in. long; bracts veiny, large, entire. India.

cristata. To 3 ft.: lvs. oval, to 3½ in. long: fls. blue, 2 in. long, in dense spikes; bracts with long spiny teeth. India.

BARLEY: *Hordeum vulgare.*

BAROSMA. *Rutaceæ.* S. African heath-like shrubs with mostly opposite leathery lvs. and 5-parted fls. solitary or clustered; one species intro. in S. Calif. Propagated by cuttings of mature wood.

ovata. To 2 ft., much branched: lvs. ovate or obovate, to ½ in. long, shining: fls. white, ⅙ in. long, solitary.

BARRINGTONIA. *Lecythidaceæ.* Evergreen trees of the Old World tropics, having large lvs. crowded at ends of branches and white or reddish fls. with many protruding stamens, borne in spikes or racemes; the following planted in tropics and intro. in S. Calif.

speciosa. To 50 ft.: lvs. obovate, to 15 in. long, entire, shining: fls. with white petals 2 in. long and longer purplish stamens: fr. 4-angled, 3 in. across, with 1 large seed, style and calyx-lobes persistent. India.

BARTONIA AUREA: *Mentzelia Lindleyi.*

BARYXYLUM: *Peltophorum.*

BASELLA. MALABAR-NIGHTSHADE. *Basellaceæ.* Two Asian twining herbaceous vines with fleshy ovate to ovate-lanceolate lvs. and small inconspicuous fls. in clusters on long thickened stalks; grown as pot-herbs in trop. regions. In the N. seeds must be started indoors under heat.

alba. Lvs. longer than broad: fls. whitish.

rubra. Lvs. about as broad as long: fls. reddish.

BASELLACEÆ. BASELLA FAMILY. Five genera of climbing or decumbent perennials from trop. Amer. and Asia, somewhat allied to the chenopods, having alternate fleshy lvs. and small regular bisexual fls. with 2 sepals, 5 petals and stamens, superior 1-celled ovary, and fr. inclosed by the corolla. Basella and Ullucus are sometimes grown for food and Boussingaultia for ornament.

BASIL: *Ocimum.*

BASKET-FLOWER: *Centaurea americana, Hymenocallis calathina.*

BASKET-OF-GOLD: *Alyssum saxatile.*

BASKET PLANTS are those of a more or less viney or trailing or diffuse habit that make a good appearance in hanging baskets and pots and that are of simple cultural requirements. The term is employed for those subjects customarily grown on porches and in windows rather than regularly in greenhouses. Some of them are annuals of simple culture. Others are perennials propagated by means of cuttings, as ivy (Hedera), vinca, strawberry geranium, nasturtium, senecio, glechoma. Sometimes oxalis and spring bulbs are included. Basket plants do not constitute a cultural group, and need not be further considered separately. In growing basket plants one must be sure that caution is taken against excessive drying out.

BASSWOOD: *Tilia.*

BAST, CUBAN: *Hibiscus elatus.*

BATEMANNIA: *Huntleya Burtii.*

BATOCYDIA UNGUIS: *Doxantha Unguis-cati.*

BATODENDRON: *Vaccinium arboreum.*

BATRACHIUM: see *Ranunculus.*

BAUERA. *Saxifragaceæ.* Evergreen shrubs of Australia and Tasmania, often somewhat heath-like in foliage, with opposite 3-parted lvs. and white, pink or purple fls. solitary in the axils or clustered at ends of sts.

One attractive species is grown in the cool greenhouse and blooms throughout winter and spring. Propagated by cuttings of half-ripened wood in spring.

rubioides. To 6 ft. or more, often prostrate: lfts. oblong or lanceolate, to ½ in. long, toothed: fls. pink or white, ½ in. across.

BAUHINIA. *Leguminosæ.* Trop. trees or shrubs, often climbing, with simple lvs. which are usually 2-lobed or -parted, fls. in terminal or axillary cymes, and long flat pods; grown for ornament in warm countries. Propagated by seeds, suckers, and cuttings over heat.

aculeata (*B. Ungula*). Tree-like shrub with spine-like stipules: lvs. glabrous, subcordate at base, the 2 lobes ovate and 3-nerved and parted about one-fourth the way down: petals lanceolate and crenate, stamens 9 or 10: pod narrow, flat. Colombia.

acuminata. Shrub to 6 ft.: lvs. lobed less than half way: fls. white, in racemes: pod to 5 in. long. India, Malaya, China.

alba: *B. variegata* var. *candida.*

candicans: probably *B. candida* is meant (*corniculata*). See also *B. variegata* var. *candida.*

candida: *B. corniculata, B. variegata* var.

corniculata. Erect shrub: lvs. lobed nearly one-half depth of lf., lobes obtuse: fls. white, 2½–3 in. long, with narrow long-clawed petals and prominent colored stamens. Brazil, Paraguay.—The plant grown in Calif. as *B. candida* apparently belongs here.

corymbosa. Climbing: lvs. lobed nearly to middle: fls. pinkish, in loose racemes. E. Asia.

forficata. Shrub or small tree: lvs. forked into long narrow lobes: fls. white or cream-colored, 1–3 in the axils, with long narrow petals: pods to 10 in. Brazil.

Galpini. Shrub to 10 ft., half-climbing: lvs. 2-lobed: fls. brick-red, in few-fld. racemes: pods to 5 in. long. S. and trop. Afr.

grandiflora: a name often applied to *B. variegata.*

Kappleri: *B. monandra.*

mexicana. PATA-VACA. Large shrub or small tree: lvs. forked one-half-way down, lobes spreading and acute: fls. small, in clusters, petals white, stamens very long. Mex.

monandra (*B. Kappleri*). BUTTERFLY-FLOWER. JERUSALEM DATE. Shrub or small tree: lvs. broadly lobed about one-third their length: fls. pink with purple markings, in terminal racemes, having only 1 fertile stamen: pods to 9 in. long. Probably Guiana.

picta. Erect: lvs. roundish-elliptic, the lobes nearly ovate and acutish: fls. white, in terminal racemes, petals oblong. Colombia.

purpurea (*B. triandra*). Tree: lvs. broadly lobed about one-third their length: fls. red or white, with long narrow petals. India, China.—Name sometimes erroneously applied to *B. variegata.*

racemosa. Small bush-like tree with hanging branches: lvs. rather small, broader than long, with short very obtuse lobes: fls. yellow, small, in loose racemes. India.

tomentosa. ST.-THOMAS-TREE. Shrub to 15 ft.: lvs. small, broadly lobed to one- or two-thirds their length: fls. yellow with a red or chocolate blotch on one petal, 1–3 in the axils: pods to 5 in. long. India, China, Afr.

triandra: *B. purpurea.*

Ungula: *B. aculeata.*

Vahlii. MALU CREEPER. Tall climber: lvs. very large, broadly lobed to one-third or one-fourth their length: fls. white becoming yellowish. in many-fld. terminal clusters: pods to 1 ft. long. Himalayas.

variegata. MOUNTAIN EBONY. ORCHID-TREE. Tree: lvs. broadly lobed to about one-third their length: fls. lavender to purple, with broad petals, few together in the axils: pods to 1 ft. long. India, China. Much planted in S. Fla. Var. **candida** (*B. alba*) has white fls.

BAYBERRY: *Myrica.*

BAY, BULL: *Magnolia grandiflora, Persea Borbonia.* **Loblolly:** *Gordonia Lasianthus.* **Red:** *Persea Borbonia* and *pubescens.* **Rose:** *Rhododendron.* **-Rum-Tree:** *Pimenta acris.* **Sweet:** *Laurus, Magnolia virginiana.*

BEAD-PLANT: *Nertera depressa.*

BEAD-TREE: *Adenanthera, Melia.*

BEAM-TREE, WHITE: *Sorbus Aria.*

BEAN. Various species of Phaseolus are commonly known as beans, as: common field, kidney or snap bean, *Phaseolus vulgaris;* lima bean, *P. limensis;* sieva or civet bean, *P. lunatus;* these species are annual twiners, but with bush or dwarf varieties. White Dutch Runner and Scarlet Runner, *P. coccineus,* are perennial but grown as annuals, also twiners with bush forms. All these plants are tender, to be planted only after the weather is warm and settled. Broad, Windsor or horse bean, *Vicia Faba,* is a stiffly erect hardy annual grown in North America mostly in Canada, and especially in the maritime districts; it does not thrive in hot dry summers. Other kinds of beans are grown for ornament, for forage and special purposes. See *Dolichos, Glycine, Phaseolus, Vigna.*

The present statements about culture of beans apply to the phaseolus kinds mentioned above. In respect to their uses, they may be divided into three categories; viz., those used as string or snap beans, the entire pod being eaten; those used as shell beans, the full-size but immature beans being shelled from the pod and cooked; dry beans, or those eaten in their dry or winter condition. The same variety of bean may be used for all of these three purposes at different stages of its development, but there are varieties better suited to one purpose than the other.

Beans will grow in most soils, but the best results may be expected in ground well enriched and in good physical condition. From the 5th to the 10th of May in the latitude of central New York, it will be safe to plant beans for an early crop. No vegetable seed decays quicker than beans, and the delay caused by waiting for the ground to become warm and free from excessive moisture will be more than made up by the rapidity of growth when finally they are planted. The beans may be dropped 2 inches deep in shallow drills, the seeds to lie 3 inches apart. Cover to the surface of the soil, and if the ground be dry, firm it with the foot or the back of the hoe. For the bush varieties, allow 2 feet between the drill-rows. Pole beans are given more room, and support must be provided. The bush varieties may be planted at intervals of two weeks from the first planting until the 10th of August. Each planting may be on ground previously occupied by some early-maturing crop. Thus, the first to third plantings may be on ground from which has been harvested a crop of spinach, early radish or lettuce; after that, on ground where early peas have been grown; and the later sowings where beets or early potatoes have grown. String beans for canning are commonly taken from the last crop. One quart of seed will plant about 100 feet of drill.

Limas are the richest of beans, but they often fail to mature in the northern states. The land should not be very rich in nitrogen (or stable manure), else the plants will run too much to vine and be too late. Choose a fertile sandy or gravelly soil with warm exposure, use some soluble commercial fertilizer to start them off, and give them the best of culture. Aim to have the pods set before the droughts of midsummer come. The pole limas are commonly planted in hills that are 2 to 4 feet apart in the rows; 1 quart of beans plants about 100 hills. Good trellises for beans are made by strong twine stretched between two horizontal wires, one of which is drawn a foot above the ground and the other 6 or 7 feet high; but in the end, good chicken-wire screen, stored in winter, is best. Dwarf limas are more desirable for small gardens than the pole varieties, as they may be planted much closer, the bother of procuring poles and twine is avoided, and the garden will have a more sightly appearance; they are grown in rows that are about 2½ feet apart. But the dwarf limas and pole limas require a longer season than the common garden bush beans, and usually only one planting is made.

Beans are attacked by a good number of diseases and insects, for the control of which the grower should consult the latest bulletins and books.

BEAN: *Phaseolus.* **Asparagus:** *Vigna sesquipedalis.* **Black:** *Castanospermum australe.* **Broad:** *Vicia Faba.* **Castor-:** *Ricinus communis.* **Goa:** *Psophocarpus tetragonolobus.* **Horse:** *Vicia Faba.* **Hyacinth:** *Dolichos Lablab.* **Indian-:** *Catalpa bignonioides.* **Jack:** *Canavalia ensiformis.* **Lyon:** *Stizolobium niveum.* **Mescal:** *Sophora secundiflora.* **Potato:** *Apios tuberosa.* **Screw:** *Strombocarpa odorata.* **Soy:** see *Soybean.* **Sword:** *Canavalia gladiata.* **-Tree:** *Laburnum anagyroides.* **Velvet:** *Stizolobium.* **Wild:** *Apios tuberosa.* **Yam:** *Pachyrhizus.* **Yard-long:** *Vigna sesquipedalis.* **Yokohoma:** *Stizolobium Hasjoo.*

BEARBERRY: *Arctostaphylos, Arctous.*

BEARD: a long awn or bristle-like hair, particularly when in tufts.

BEARD-TONGUE: *Penstemon.*

BEARS-BREECH: *Acanthus.*

BEARS-TAIL, CRETAN: *Celsia Arcturus.*

BEAUCARNEA. *Liliaceæ.* Tree-like plants in dry regions of Tex. and Mex. with tall trunks somewhat swollen at base, long linear stiff lvs. and small whitish fls. in panicles; sometimes retained in the genus Nolina; suitable for outdoor planting in warm dry regions. Cult. as for *Yucca.*

recurvata (*Nolina tuberculata*). To 30 ft.: lvs. to 6 ft. long and ¾ in. wide, recurving. Mex.

BEAUFORTIA. *Myrtaceæ.* Stiff heath-like shrubs of W. Australia, with small opposite lvs. and mostly red sessile fls. in dense heads or short spikes; one species intro. in S. Calif. Propagated by cuttings of hardening shoots under glass.

purpurea. Small shrub: lvs. ovate- to linear-lanceolate, to ⅙ in. long: fls. small, in dense heads, stamens purple.

BEAUMONTIA. *Apocynaceæ.* A few woody vines from Java to E. India, with opposite lvs., very large showy funnelform fls. in terminal cymes, leafy lobed calyx, and long cylindrical fr.

One is grown in greenhouses in rich loamy soil; it should not be planted in pots; also planted out-of-doors in the South. Propagated by cuttings.

grandiflora. HERALDS-TRUMPET. Lvs. oval or obovate, to 8 in. long: fls. white, trumpet-shaped, to 5 in. long and as broad, fragrant, spring-blooming. Himalayas.

BEAUTY-BERRY: *Callicarpa.*

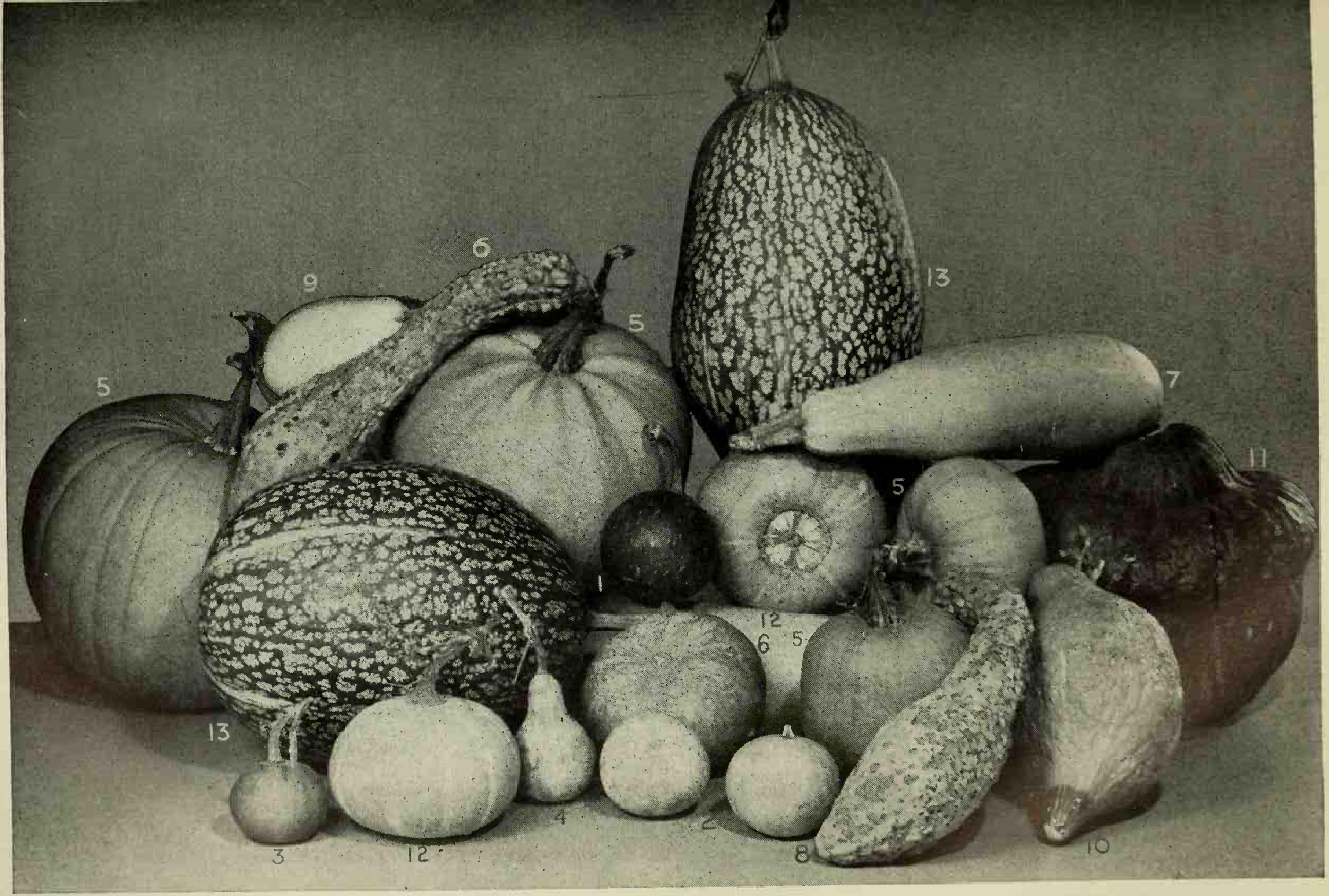
BEAUTY-BUSH: *Kolkwitzia amabilis.*

BEDDING is a more or less technical term to denote the growing of plants in beds or masses in distinction from placing them singly or in lines or "hills." It is commonly employed to designate the close massing of plants in the open ground for the making of striking displays of color or leafage; it is ordinarily a more or less temporary recourse for spring, summer or autumn show, although the name is sometimes given to assembled effects of perennials as of grasses and even of low evergreens. Sometimes the bed is of short duration even though the plants are perennial, as with the spring bulbs. It is evident that for temporary or seasonal effects the site must be well chosen and the ground carefully prepared so that results are obtained speedily and at the desired date.

In spring bedding the plants are commonly tulips, hyacinths, crocuses or other early-flowering bulbous plants. In this case, the ground is usually occupied later in the season by other plants. These later may be annuals, the seeds of which are sown amongst the bulbs as soon as the season is far enough advanced; or the annuals may be started in boxes and the plants transplanted amongst the bulbs as soon as the weather is fit. Heavy early over-planting of this kind, however, is likely to weaken the bulbs or prevent their proper maturation.

Summer bedding is often made with perennial plants carried over from the preceding year, or better, propagated for that particular purpose in February and March. Such plants as geranium, coleus, alyssum, scarlet salvia, ageratum and heliotrope may be grown for these beds. It is a common practice to use geranium plants which are in bloom in winter for bedding out in the summer, but such plants are tall and ungainly in form and have expended the greater part of their energies. It is better to propagate new plants by taking cuttings or slips late in the winter and setting out young, fresh, vigorous subjects. Many of the low-growing and compact continuous-flowering annuals are also excellent for summer bedding effects.

Bedding of another type attempts to make patterns or designs; it is carpet-bedding. Comparatively few subjects are adapted to this purpose, for the plants must be such as will stand shearing and have very strong and constant colors of foliage. The most popular bedding plants are coleus (particularly the yellow Golden Bedder), achyranthes, alternanthera, *Centaurea gymnocarpa,* and such succulent plants as the houseleeks. Some of the annual flowers may also be used for strong color effects, as *Lobelia Erinus* and sweet alyssum. Ordinarily the making of carpet-beds should be left to professional gardeners, since it requires much skill and care to make and keep the beds in perfect condition; and a ragged or imperfect carpet-bed is worse than no bed at all. Carpet-beds are really curiosities, and they have no more legitimate place in the general pictorial landscape design area than painted stones or sheared evergreens. Therefore, they should be placed by themselves at one side, where they do not interfere with the general design of the place.



III. Cucurbits, — Gourds, Pumpkins, Squashes. — 1, The native wild Okeechobee gourd, of the Florida Everglades, *Cucurbita okeechobeensis.* 2, The native wild gourd of Texas, *Cucurbita texana.* 3–8, forms of *Cucurbita Pepo*: 3 Orange gourd, 4 Pear gourd, 5 right field pumpkins, 6 below left striped gourd, 7 a white bush type, 8 summer crookneck. 9, Cushaw *Cucurbita moschata.* 10–12, *Cucurbita maxima*: 10 Golden Hubbard squash, 11 Bay State squash, 12 above Small Chinese squash. 13, Malabar gourd, *Cucurbita ficifolia*

In public parks they make a very useful attraction when set off by themselves, the same as topiary work or other specialties.

Bold subtropical effects can be produced by planting in the open such subjects as palms, bananas, crotons, araucarias, caladiums and cannas as well as by castor-beans and other quick growers. Plants like bananas and palms, which are kept normally in pots, would better be left in the pots and plunged to the rims rather than turned out directly into the ground. To attain quick and continuous effects, it is advisable to set the plants rather close. As these plants are likely to be injured by strong winds, it is well to have subtropical beds in a somewhat protected place. Care must be taken to provide good water supply, for the effects are conditioned largely on luxurious growth and clean foliage.

BEDSTRAW: *Galium.*

BEECH: *Fagus.* **Australian:** *Eucalyptus polyanthemos.* **Blue:** *Carpinus caroliniana.*

BEEFWOOD: *Casuarina.*

BEET: *Beta.*

BEFARIA (*Bejaria*). *Ericaceæ.* Evergreen shrubs with alternate entire lvs. and white, yellow or red fls. in terminal racemes or corymbs; native Fla., Mex., S. Amer. and one species sometimes planted in Fla.

racemosa. TAR-FLOWER. To 6 ft.: lvs. oval or oblong, to 2 in. long, leathery: fls. white, 2 in. across, in showy racemes to 8 in. long. S. Ga., Fla., in sandy soil and low places.

BEGGARWEED: *Desmodium purpureum.*

BEGONIA. *Begoniaceæ.* A great trop. genus, around the world, comprising subjects ornamental for foliage, habit and bloom: sappy or succulent herbs or herb-like shrubs; a few of them are annuals: lvs. alternate, often large and colored or illustrated, usually oblique or lop-sided: fls. monœcious, white, pink, red, yellow, the ovary inferior and usually similarly colored. Begonias have given rise, under cult., to numberless forms and hybrids and many of them bear Latin names as if they were species, thus adding to the confusion of the nomenclature. Present-day florists begonias are mostly of the *B. semperflorens* relationship. The following species are per. unless otherwise stated.

Begonias are all tender plants, impatient also of dry and droughty conditions. They are glasshouse or lathhouse or window-garden subjects, requiring protection from burning sun, although many of the kinds are useful for bedding-out in protected areas. Three main horticultural classes may be recognized: the fibrous-rooted (or rootstock very small, if any), mostly tall and branching; the rhizomatous, with the stems or rootstocks running on the surface of the ground and the plants usually without erect branching stems, comprising species with conspicuously heavy ornamental foliage; the tuberous-rooted. *B. socotrana* is bulbous. The lines between these divisions are often more or less indefinite. The stem-bearing fibrous-rooted kinds grow readily from cuttings of the firm half-ripened wood, and rhizomatous species by division of the rootstocks. All the species are readily raised from seeds under cover; the heavy-leaved kinds propagate from leaf-cuttings, as the rex varieties. The tuberous kinds, which are summer bloomers, are grown mostly from seeds although the tuber may be divided; the tubers rest in winter. Tubers usually produce their best bloom two years or seasons from seed, although they may be dried off when flowers are past and growth is fully mature and used over again for several years. Seeds of begonias are small and they must be covered lightly and always treated with care in a protected seed-bed. The fibrous-rooted branching kinds contain the winter bloomers although many of them also bear colored and attractive leaves; it is well to keep fresh plants of them coming on each year.

acuminata: *B. acutifolia.*

acutifolia (*B. acuminata*). Fibrous: subshrubby to 3 or 4 ft.: lvs. oblong to ovate-acuminate, 2–3 in. long, serrate: fls. white, about 1 in. across, 3–5 on a peduncle. Jamaica.

alba perfecta: trade name for a tall fibrous-rooted plant with white fls.

alba scandens: see *B. scandens.*

albo-picta. Fibrous: shrubby, branched, compact: lvs. elliptic-lanceolate, not large, glossy-green and silvery-spotted: fls. rather small, greenish-white. Brazil.

angularis (*B. zebrina*). Fibrous: plant smooth, shrubby, to 8 ft.: lvs. long ovate-acuminate, green and glossy above with white veins, tinged reddish underneath: fls. white, ⅔ in. across, in large clusters. Brazil.

argenteo-guttata. Fibrous: strong and branching, 2–4 ft., glabrous: lvs. ovate-acuminate, 4–6 in. long, angled or toothed, white-speckled: fls. white tinged pink, in axillary clusters. Cultigen; supposed hybrid.

argyrostigma: *B. maculata.*

ascotiensis. Fibrous: lvs. ovate, 2 in. long, dentate, brown with green margin: fls. bright red, long-peduncled. Cultigen; supposed to be *B. fuchsioides* × *B. semperflorens.*

boliviensis. Tuberous: st. 2–3 ft. high, somewhat hairy, becoming more or less drooping: lvs. lanceolate to narrow-ovate, acuminate, serrate, 3–5 in. long: fls. cinnabar-scarlet, fuchsia-like. Bolivia.—Has entered into some of the garden tuberous begonias (*B. tuberhybrida*).

Bowringiana: *B. laciniata.*

Bunchii: see *B. Feastii.*

carminata. Fibrous: rather tall, branching: lvs. ovate-acuminate, deeply toothed but not lobed, green: fls. in hanging clusters, rose-scarlet. Recorded as a cross between *B. coccinea* and *B. Dregei.*

caroliniæfolia. Fibrous: st. thick and fleshy: lvs. palmate, divided into 6–8 long ovate stalked lfts.: fls. small and pink, on long peduncles. Mex.

Carrierei: derivative from *B. semperflorens.*

Clarkei. Tuberous: st. erect to 2 ft., fleshy, puberulent: lvs. cordate-ovate, serrate: fls. large and bright red, in pendulous racemes. Bolivia at high altitudes.—Has contributed to the race of hort. tuberous begonias (*B. tuberhybrida*).

coccinea (*B. rubra*). Fibrous: sts. glabrous, becoming 3–4 ft., branching: lvs. thick, oblong to ovate, 4–6 in. long, reddish underneath: fls. large, wax-like and coral-red, in drooping clusters. Brazil.—Has given rise by variation and hybridization to many good forms, as Lucerna, President Carnot.

conchæfolia (*B. Warscewiczii*). Rhizomatous: lvs. ovate-cordate, 4–6 in. long, basal lobes overlapping, reddish and hairy underneath: fls. pink to nearly white, fragrant, on long peduncles. Cent. Amer.

corallina. Fibrous: related to *B. maculata* or a form of it, very free-flowering; 8–10 ft., needing support: lvs. cordate-lanceolate, glossy-green: fls. coral-red, in drooping long clusters. Cultigen.—The name is also applied to a form of *B. coccinea.*

crispa: *B. manicata* var.; also a form of tuberous begonia.

cypræa: a form of *B. metallica.*

Davisii. Tuberous, acaulescent: lvs. ovate-cordate, thin-hairy, red underneath: fls. bright red, as well as peduncles. Peru.—Has contributed to the garden tuberous begonias (*B. tuberhybrida*).

decora: hort. name for a tall fibrous-rooted begonia, with white odorous fls.

diadema. Fibrous: sts. 2 ft., fleshy: lvs. deeply parted, maple-like, dentate, green blotched white: fls. very small, pink. Borneo.

dichotoma. Fibrous: upright, 2–3 ft., glabrous, st. thick: lvs. nearly orbicular to ovate, 3–12 in. long, serrulate and angled, bright green: fls. white, small, in long-peduncled clusters. Venezuela.

Digwilliana. Fibrous: nearly or quite erect, of intermediate stature: lvs. elliptic, 2–4 in. long, serrate, dark rich green: fls. rosy-scarlet, drooping. Cultigen; probably a hybrid from *B. fuchsioides*.

domingensis. Subshrubby but low, with hard glabrous branches and hairy branchlets: lvs. small, ovate-acute, somewhat cordate and lobed, 1 in. or so long, glabrous above and hairy on nerves underneath: fls. white, small, in close cymes. Hispaniola.

Dregei. Tuberous or semi-tuberous: sts. ann. from the tuber, succulent, red, 1–3 ft.: lvs. ovate or rhombic, about 3 in. long, angled and more or less lobed, red-ribbed underneath: fls. few and white, on axillary peduncles. S. Afr. Var. **Macbethii** (*B. Macbethii*) is mostly smaller and more slender, 1–1½ ft. high: lvs. smaller, deeply notched-lobed: fls. smaller. Probably a cultigen.

Duchartrei. Fibrous: st. branched and hairy, 2–3 ft. and more: lvs. ovate-lanceolate, long-acuminate, 5–8 in. long, dentate, reddish underneath: fls. large, waxy-white and with red hairs, in long-stemmed compact clusters. Cultigen; apparently hybrid from *B. Scharffiana*.

Erfordii. Fibrous: dwarf and bushy, to 1½ ft.: fls. rose-carmine. Hybrid of *B. Schmidtiana* and a form of *B. semperflorens*.

Evansiana. Tuberous: glabrous, branching, sts. to 2 ft., deciduous: lvs. ovate, acute and subcordate, lobed and denticulate, red underneath: fls. large, flesh-color. China, Japan.—Stands some frost; propagates by axillary bulblets.

Feastii. Rhizomatous: lvs. nearly orbicular, thick, red underneath, hairy on edges: fls. light pink, long-peduncled. Hybrid of *B. manicata* and *B. hydrocotylifolia*.—A form with lf.-margins crested and frilled is *B. Bunchii*.

fimbriata: reported as a tuberous begonia with fringed petals.

floribunda: *B. multiflora*.

foliosa. Fibrous: small smooth semi-shrubby very leafy plant to 1½ ft.: lvs. about ½ in. long, distichous on short shaggy branchlets, notch-lobed: fls. 1–3 together on slender axillary peduncles, white tinged rose, about ½ in. across. Colombia.—Good basket and conservatory plant.

Franconis. Ann., pubescent, erect, to 6 in.: lvs. small, unequally ovate, subcordate, to 2 in. long, crenate and ciliate, 7-nerved: fls. white or pinkish, axillary and few. Mex.

Frœbelii. Tuberous: lvs. cordate-acuminate, with fleshy purplish hairs: fls. bright scarlet, large, in tall branching drooping clusters (see *B. tuberhybrida*). Ecuador.

fuchsioides. Fibrous but with very short rootstock: st. slender, 2–3 ft., branchlets shaggy: lvs. ovate and lop-sided, to 1½ in. long, serrulate: fls. fuchsia-like, scarlet, ½–¾ in. across. Mex.—Good conservatory plant.

gigantea: *B. semperflorens* var. Another *B. gigantea* is a rhizomatous plant, probably of garden origin, with st. 2–3 ft. high: lvs. long-acuminate, to 1 ft. long: fls. many and small, white or pale pink.

Gilsoni. Fibrous: st. shrubby, to 2 ft., more or less procumbent: lvs. large, lobed, pointed and somewhat fluted, dark green: fls. double or crested, light pink, on long erect peduncles. Cultigen.

glandulifera. To 2 ft., with a fleshy creeping rooting st.: lvs. obliquely cordate-ovate, to 6 in. long, serrulate, sparsely hairy underneath and on margins: fls. white, in long-stalked open clusters. W. Indies.

glaucophylla. Rhizomatous: sts. glabrous, long and drooping or climbing on rafters: lvs. ovate and wavy, 3 in. long, glaucous, white-spotted above, purple underneath: fls. brick-red, to 1 in. across, in clusters. Brazil.—Sometimes erroneously called *B. scandens*.

gracilis. Tuberous: st. erect, mostly unbranched, smooth: lvs. heart-shaped, lobed and denticulate: fls. pink, in summer, on short axillary peduncles: bulblets in the lf.-axils may be used for propagation. Mex.

Gregoriana: a listed name.

gunneræfolia. Fibrous: tree-like but little if at all branched, sts. scaly and more or less woolly: lvs. large, to 16 in. across, nearly orbicular, dentate-notched or with small angle-lobes: fls. very small, whitish, in axillary clusters. Colombia.

Haageana. Fibrous: plant red-hairy, st. shrubby, 2–4 ft.: lvs. ovate-cordate, to 10 in. long, wavy, nerves red above: fls. rose-pink, in large hanging showy clusters. Brazil.—See *B. Scharffiana*.

heracleifolia. Rhizomatous, hairy: lvs. long-stalked, orbicular, to 1 ft. or more across, with 5–9 deep narrow dentate lobes that extend to the middle of the blade or beyond: fls. white or rose, small, to 1 in. across, on peduncles 2–4 ft. high. Mex.

humilis. Ann. to 15 in., erect and branching: lvs. thin, narrow-ovate and pointed, 2 in. long, oblique and subcordate, sparsely hairy, dentate and serrulate: fls. white, small, in open long-stalked clusters. Trinidad.

hydrocotylifolia. Rhizomatous, hairy: lvs. roundish-cordate, repand and not lobed, short-stalked: fls. rose-colored, small but many, on peduncle to 1½ ft. high. Mex.

illustrata: trade name for a rhizomatous plant with round unlobed lvs. and sunken green markings along veins: probably a form of *B. imperialis*.

imperialis. Rhizomatous very hairy condensed low plant: lvs. cordate-ovate, 2–6 in. long, serrulate, green above and lighter along the veins, brown-green underneath: fls. white, about ½ in. across, on scapes or peduncles not exceeding the foliage. Mex.—Commonly grown as Otto Foerster. In var. **smaragdina** the lvs. are wholly bright green.

incana (*B. peltata* of cult.). Fibrous, scurfy-tomentose on stalks and foliage: st. 1–2 ft. tall and mostly simple: lvs. broad-ovate to nearly orbicular, peltate, 4–9 in. long, entire or repand: fls. white, 1 in. across, in clusters on long peduncles. Brazil.

incarnata. Fibrous: st. branching, erect, 2–3 ft.: lvs. oblong to ovate, 4–10 in. long and long-pointed, notched and semi-lobed, reddish-green underneath, often more or less spotted or feathered above: fls. rose-colored, to 1½ in. across, in hanging clusters. Mex.

Ingramii. Fibrous: to 3 ft., with horizontal blooming side branches: lvs. small, lance-ovate, serrate, green, tinted red in the sun: fls. rose, large for the group, as the plant is a hybrid of *B. nitida* and *B. fuchsioides*; free-blooming.

laciniata (*B. Bowringiana*). Fibrous: sts. to 2 ft.: lvs. broad cordate-ovate, 5–8 in. long, glabrous or nearly so except on edges, angled to sharp-lobed to laciniate, purplish-black above and broad green band between margin and rib: fls. white, about 2 in. across, few on a long peduncle. China.

Lesoudsii: reported as a form of Rex begonia.

Lindleyana. Erect, st. fleshy, red-hairy: lvs. ovate-acute, peltate, to 6 in. long, toothed and somewhat lobed: fls. in branching clusters, white. Guatemala.

Lloydii. Tuberous: drooping habit: fls. single and double, white and colored. Hort. name.

lobata. Fibrous: lvs. pointed, spotted: fls. white. Hort. name.

Lucerna: form of *B. coccinea*, or hybrid, with white-spotted foliage.

luxurians. Fibrous: sts., stalks and lvs. hairy: lvs. palmately compound, lfts. 7–17, lanceolate and serrate and 3–6 in. long and about 1 in. broad, upper surface reddish, under surface green: fls. small, cream-color, in long-peduncled clusters. Chile.

Macbethii: *B. Dregei* var.

macrophylla: *B. nelumbiifolia*.

maculata (*B. argyrostigma*). Fibrous, plant smooth: sts. branched, 2–5 or more ft.: lvs. oblong to oblong-ovate, thick, 4–8 in. long, obtuse or nearly so, undulate, green and with circular white dots above, red underneath: fls. pale rose to white, about 1 in. across, in hanging clusters. Brazil.

magnifica: hort. name for a form of *B. Rex-cultorum* as well as for one of the *B. semperflorens* type; the true *B. magnifica* of Colombia, a smooth and shining suffrutescent rhizomatous species, is probably not in cult. with us.

manicata. Rhizomatous: plant mostly glabrous except on lf.-margins and ribs: lvs. short-ovate, 4-8 in. long, fleshy, sinuate-dentate, shining green above, reddish underneath: fls. about ½ in. long, pink, the peduncles exceeding the foliage. Mex.—Runs into cristate and spotted forms under cult.; see also *B. Feastii*.

Margaritæ. Fibrous: sts. 1–2 ft. high, purple and hairy: lvs. ovate-acuminate, sinuate-dentate, green and purplish above, red underneath: fls. large, rose-colored, in clusters. Cultigen; *B. metallica* is said to be one parent.

Martiana: form of *B. gracilis.*

metallica. Fibrous: sts. erect and shaggy, to 4 ft.: lvs. ovate, to 6 in. long, angled or lobed, margins sinuate-serrate, green and metallic-tinted above, lighter underneath: fls. blush-white to light rose, to 1½ in. across, in peduncled clusters. Brazil.

multiflora (*B. floribunda*). Fibrous, tall, resistant: a form of *B. fuchsioides* or a derivative: fls. delicate pink.

narcissiflora: hort. name for a class of tuberous begonias with fls. shaped like a single daffodil, yellow, pink and red.

nelumbiifolia (*B. macrophylla*). Rhizomatous: lvs. round-ovate to nearly orbicular, to 18 in. long, peltate, not lobed, serrulate and ciliate, short-pointed, green both surfaces, mostly hairy on nerves: fls. white or pinkish, ½ in. or less across, on tall peduncle. Mex.

nigricans (*B. subpeltata nigricans* of hort. lists). Fibrous: erect, branched, 2–3 ft.: lvs, ovate, acuminate, to 9 in. long, angled-toothed, bristly-serrate, silvery-green and somewhat marked above with darker areas, red underneath, hairs often dark red: fls. rose, about 1 in. across, in peduncled clusters. Cultigen.

nitida. Fibrous, glabrous: sts. branched, 3–5 ft.: lvs. reniform-ovate, 4–6 in. long, crenate-dentate, green and glossy: fls. pink or rose, to 1½ in. across, in large peduncled clusters. Jamaica. Var. **odorata alba** has smaller sweet-scented fls.

odorata: *B. nitida* var.

olbia. Fibrous: st. short and erect, mostly branched: lvs. ovate, to 5 in. long, dentate and somewhat angle-lobed, hairy and bronzy-green and white-dotted above, red underneath: fls. white, in short drooping axillary clusters. Brazil.

palmaris. Fibrous: much like *B. olbia* but lvs. not spotted and reniform-ovate, to 10 in. long and usually with about 3 triangular-acute lobes: fls. white, with serrate petals, more or less hidden in the foliage. Brazil.

palmata: hort. name for a plant with cane-like growth and large palmate silver-striped lvs.

palmifolia: hort. name for a plant with large lobed green lvs. and white fls. in clusters.

Pearcei. Tuberous: sts. branched, 1 ft. high: lvs. broad-ovate and cordate, acuminate, toothed, glabrous and green above, tomentose and pale red underneath: fls. bright yellow, large, in axillary clusters. Bolivia.—It has intro. the yellow color into the hort. tuberous begonias (*B. tuberhybrida*).

peltata: *B. incana.*

phyllomaniaca. Fibrous: sts. erect, branching, producing, as do the lvs., many buds and leafy growths: lvs. narrowly cordate-ovate and long-acuminate, to 7 in. long, side-lobed and toothed, green both surfaces: fls. pale pink, ¾ in. across, in hanging clusters. Brazil.

picta: hort. name for a fibrous-rooted begonia with small narrow lvs. spotted white and white fls. (*picta alba*); *picta rosea* has rose-colored fls. and often spotted foliage: both are probably forms of *B. coccinea.*

prunifolia: hort. name for a plant of the *Scharffiana* type, with foliage plum-colored underneath: fibrous: sts. branched, hairy: lvs. to 6 in. long, oblique-ovate, red-hairy on veins underneath: fls. white, in large pendent clusters.

Rajah. Rhizomatous: lvs. angular-orbicular, papery, serrate, smooth above and with green ribs and brown-red intermediate areas, setose on veins underneath: fls. pink, small, on peduncles about as high as foliage. Malaya.

Rex. Rhizomatous: lvs. ovate, to 12 in. long, hanging on the hairy petiole, sinuate-dentate, reddish underneath and hairy on veins, metallic-green above with silvery zone about 1 in. wide midway between margin and outside of which is purplish: fls. pale rose, about 2 in. across, above the foliage. Assam.—Little known in hort.

Rex-cultorum. The Rex begonias of hort., with variously marked, blotched or marbled not lobed lvs. that are sometimes helix-like or spiralled in center. Derivatives from *B. Rex* through variation or hybridization.—Known sometimes as "beefsteak-geranium."

Richardsoni: hort. name for a small tuberous begonia, a form of *B. Dregei* with more deeply cut or laciniate lvs. than the var. *Macbethii*: fls. white.

ricinifolia. Hybrid derivative from *B. heracleifolia*: rhizomatous: lvs. orbicular in outline, to 1 ft. and more across, the lobes usually not extending more than about one-third the depth of the blade, bronzy-green: fls. rose-pink, to 1 in. across, on tall peduncles.

robusta: hort. name for a fibrous-rooted plant of intermediate growth, probably an offshoot of *B. fuchsioides*: sts. red, reproduced continuously from the root: lvs. oblong- acuminate, lop-sided, to 3 in. long, dentate, reddish: fls. pink to red, the staminate to 1½ in. or more across.

rosæflora. Tuberous: lvs. orbicular or reniform, 2–6 in. across, lobed, green but red-edged: fls. rose-red, 2 in. across. Peru, at high altitudes.—Has entered into the development of garden tuberous begonias (*B. tuberhybrida*).

Rossi: hort. name for a fibrous-rooted plant with bronzy foliage and light pink fls.

rubella: *B. rubellina.*

rubellina (*B. rubella* of hort. lists). Rhizomatous: lvs. broad-ovate, shallowly lobed and pointed, to 8 in. long, dull green sprinkled with dark brown spots, petiole shaggy: fls. pink, about 1 in. across, long-peduncled. Cultigen.

rubra: *B. coccinea.*

Sandersonii. Fibrous: st. glabrous, nearly or quite erect, the plant low and bushy: lvs. ovate-acuminate, to 3 or 4 in. long, doubly serrate, dark green: fls. bright scarlet, 1 in. or less long, drooping. Cultigen; probably a hybrid derivative from *B. fuchsioides.*

sanguinea. Fibrous: plant smooth and shining throughout, low, sts. several, 1½ ft. or more, red, leaf-bearing toward base: lvs. cordate-ovate, slightly peltate, to 6 in. long, entire, abruptly pointed, green above and blood-red underneath: fls. small, white, staminate to ¾ in. across, mostly above the foliage. Brazil.

scandens: a name commonly applied to the more scandent forms of *B. glaucophylla.* The true *B. scandens* has crenate-dentate lvs. and small white fls., from trop. Amer.; perhaps represented in the plant listed as *B. alba scandens.*

Scharffiana. Fibrous: plant 1–3 ft., robust, hairy: lvs. broad-ovate, to 8 in. long, pointed, olive-green above and bright red underneath: fls. large, waxy-white with conspicuous red hairs, in heavy long-peduncled clusters. Brazil.—The plant once prominently figured as *B. Scharffi* is *B. Haageana.*

Schmidtiana. Fibrous: plant usually 1 ft. or less high, sts. hairy and red-tinged: lvs. ovate- acuminate, to 3 in. long, angled or shallow-lobed, dentate, reddish underneath: fls. white tinted rose, small. Brazil.

Schnitzeri: hort. name for a low-branching semi-tuberous plant, perhaps a form of *B. Dregei*; fls. orange.

semperflorens. Fibrous: variable plant, glabrous and more or less succulent, sts. little branching, to 3 ft. high: lvs. ovate to oval, 2–4 in. across, finely serrulate and ciliate, glossy-green and commonly red-tinged on ribs: fls. rose-red to nearly white, 1 in. across, in axillary clusters. Brazil.—In its vars. and derivatives, some of them hybrids, this plant is the prevailing type of florists and bedding begonias; some of the well-known offshoots are Carrierei, Chatelaine, Cincinnati, Erfordii, Gigantea Rosea, Gloire de Louveciennes, Melior, Triomphe de Lorraine, Vernon. See also *B. socotrana.*

sempervirens: probably an error for *semperflorens.*

smaragdina: *B. imperialis* var.

Snitcheri: apparently a *B. Rex-cultorum* offshoot.

socotrana. Bulbous: sts. ann., erect, to 1 ft., somewhat branched: lvs. orbicular, to 6 or 7 in. across, centrally peltate, margins rolled or scalloped: fls. rose-pink, to 2 in. and more across, in a long-peduncled small forking cluster. Socotra, Indian Ocean.—It has entered into garden kinds, largely through hybridization with *B. semperflorens*, in such forms as Cincinnati, Gloire de Lorraine and Gloire de Sceaux.

speculata. Rhizomatous: lvs. broad-ovate to nearly orbicular, acuminate, to 8 in. across, triangular-lobed to one-quarter or one-half depth of blade, dull gray speckled gray above and reddish underneath: fls. pink-white, about 1 in. across, on long peduncle. Cultigen.

subpeltata: *B. nigricans.*

Sunderbruchii. Rhizomatous: a form of *B. heracleifolia* with palmate bronze-green lvs. bearing silver bands along the nerves and purple underneath: fls. pinkish.

Templinii. Recorded as sport from *B. phyllomaniaca*: lvs. with ruffled and fringed margins and blotched white, yellow and reddish: fls. pink.

Teuscheri. Fibrous: st. strong and erect, branched, to 6 ft. high: lvs. large and fleshy, ovate-lanceolate, serrate, bright green with grayish blotches or dots, red underneath: fls. large, bright red, in axillary clusters. Malaya.

Thurstonii. Fibrous: st. 2 ft. tall, smooth and glossy: lvs. orbicular-acuminate, red underneath: fls. pink, small, in erect clusters. Cultigen; reputed hybrid between *B. metallica* and *B. sanguinea.*

tuberhybrida: the hort. tuberous begonias, a class name, the plants of various habit and color of bloom, the issue of such species as *B. boliviensis, Clarkei, Davisii, Pearcei, rosæflora, Veitchii,* with perhaps *B. Frœbelii, gracilis* and others; some of them have low branching sts. and others only scapes.

ulmifolia. Fibrous: sts. branching, shaggy-hairy, to 3 ft.: lvs. ovate-oblong and elm-like, to 5 in. long, double-serrate, somewhat hairy: fls. small, white, ½ in. or more across, many in peduncled clusters. Colombia.

valida: a listed name.

Veitchii. Tuberous, one of the elements in the garden tuberous begonias (*B. tuberhybrida*): st. very short or practically none: lvs. nearly orbicular, lobed and cut, green: fls. cinnabar-red, 2½ in. across. Peru, high altitudes.

Verschaffeltiana (*Verschaffeltii*). Rhizomatous: lvs. very large, ovate-acuminate, lobed, green: fls. rose, in large clusters. Cultigen; reported hybrid of *B. manicata* and *B. caroliniæfolia.*

vitifolia. Fibrous: strong, to 4 ft.: lvs. large and grape-like, orbicular to reniform, lobed, serrate, pubescent, green above, rusty underneath: fls. small and white. Brazil.

Warscewiczii: *B. conchæfolia.*

weltoniensis. Tuberous or semi-tuberous: st. reddish, to 3 ft.: lvs. small, ovate-acuminate, to 2 in. across, dentate, green and smooth: fls. pink (white in var. *alba*), many on short peduncles. Cultigen; hybrid from *B. Dregei.*

Wettsteinii: hort. name for a fibrous-rooted begonia of intermediate stature, wavy green lvs. and bunches of brilliant red fls.

xanthina. Rhizomatous: habit of *B. Rex*: lvs. glossy-green above and purplish underneath: fls. bright yellow, tinged red outside, large. India.

zebrina: *B. angularis.*

BEGONIACEÆ. BEGONIA FAMILY. Some 500 species of per. and a few ann. herbs, sometimes shrub-like, mostly more or less succulent, affording many subjects prized for ornamental foliage and bloom. Some of them are somewhat tree-form although not many ft. high, others are lopping or scandent. Many of them are tuberous and not in foliage all the year. Nearly all the species are in the great genus Begonia. The other three genera (Begoniella, Hillebrandia, Symbegonia) are of very few species and not in general cult.

BEJARIA: *Befaria.*

BELAMCANDA. *Iridaceæ.* One Chinese and Japanese per. with stout rootstocks, often planted in gardens and of easy cult. in sunny locations in rich sandy loam; prized for its fls. and also for the ornamental black seeds. Propagated by seeds or division. **B. chinensis** (*Gemmingia chinensis. Pardanthus chinensis* and *sinensis*). BLACKBERRY-LILY. To 4 ft.: lvs. borne on st., to 10 in. long and 1 in. wide: fls. orange spotted with red, to 2 in. across: caps splitting in autumn, leaving a column of seeds resembling a blackberry. Nat. in U. S., and hardy N.

BELIS: *Cunninghamia.*

BELLADONNA: *Atropa Belladonna.*

BELLEVALIA: *Hyacinthus romanus.*

BELLFLOWER: *Campanula.* Chilean: *Lapageria rosea.* Giant: *Ostrowskia magnifica.*

BELLIDIASTRUM MICHELII: *Aster Bellidiastrum.*

BELLIS. *Compositæ.* Herbaceous annuals and perennials, growing in tufts or with branching sts.: lvs. alternate or all basal: heads solitary, the rays white or rose, disk-fls. yellow; pappus mostly lacking. Native in Eu. and the Medit. region.

English daisies are easily raised from seed sown in the spring for bloom the following year. The more special varieties are propagated by division in cool weather as the seeds do not reproduce true to type. The plants are favorites for edging and for colonizing in lawns; they should have fertile moist soil.

alpina: a synonym of *B. perennis.*

minutus: presumably *Bellium minutum.*

perennis. TRUE or ENGLISH DAISY. Per. to 6 in.: lvs. spatulate or obovate, in basal tufts: heads to 2 in. across, white or rose, in spring and early summer. W. Eu. A double form is var. **ranunculiflora.**

rotundifolia. Lvs. ovate or broader, often subcordate, long-stalked, coarsely toothed: heads to 1¼ in. across, with mostly white or in var. **cærulescens** blue rays. Algeria, Morocco.

BELLIUM. *Compositæ.* Small herbs with basal tufted lvs. and solitary heads of fls. with white rays and light yellow disk; pappus of bristles and scales; native in Medit. region and suitable for the rock-garden and similar places.

bellidioides. Ann. to 4 in., stoloniferous: lvs. spatulate.

minutum. Ann. to 3 in.: lvs. narrow-spatulate: heads ½ in. across.

BELLOTA: *Cryptocarya.*

BELL-VINE, PURPLE: *Rhodochiton volubile.*

BELLWORT: *Uvularia.*

BELOPERONE. *Acanthaceæ.* Trop. American herbs with opposite entire lvs. and tubular 2-lipped fls. in racemes or spikes with overlapping bracts; one species planted out in S. U. S. and also grown under glass as a pot-plant.

guttata. To 1½ ft.: lvs. ovate, to 2½ in. long, hairy: fls. white spotted with purple, 1¼ in. long, borne beneath broad reddish-brown imbricated showy bracts ¾ in. long, in dense spikes to 3½ in. long. Mex.

BELVEDERE: *Kochia scoparia.*

BENE: *Sesamum.*

BENINCASA. *Cucurbitaceæ.* Ann. hairy pumpkin-like tendriliferous vine grown, particularly by Chinese, for the large fr. which is used in the making of preserves and sweet pickles and said to be eaten raw in warm countries; probably only one species. Cult. as for pumpkin and squash.

cerifera: *B. hispida.*

hispida (*B. cerifera*). WAX or WHITE GOURD (of India). ZIT-KWA. TUNKA. CHINESE WATERMELON and PRESERVING MELON. Long-running vine: lvs. broadly cordate-ovate, angled or somewhat lobed and toothed: fls. yellow and veiny, corolla nearly rotate and to 3 in. across: fr. oblong to cylindrical, to 16 in. long, hairy and white-waxy, flesh white; seeds oblong-pointed, white, ⅓–½ in. long. E. Asia.

BENTHAMIA: *Cornus.*

BENZOIN. *Lauraceæ.* Aromatic trees and shrubs native in Asia and N. Amer., with alternate lvs., unisexual or bisexual little fls. in axillary clusters, and fr. a drupe. Propagated by seeds sown as soon as ripe, by layers, and by cuttings of green wood under glass.

æstivale (*B. odoriferum. Lindera Benzoin*). SPICE-BUSH. Deciduous shrub to 15 ft.: lvs. oblong-obovate, to 5 in. long, turning yellow in autumn: fls. before the lvs. in early spring, greenish-yellow, small: fr. scarlet. Moist places and lowlands, Me. to Fla. and Tex.

grandifolium. Evergreen shrub or tree to 60 ft.: lvs. oblanceolate, to 8 in. long, shining: fls. yellow: fr. black. China.

obtusilobum. Deciduous shrub or tree to 30 ft.: lvs. broad-ovate, to 5 in. long, entire or 3-lobed at apex: fls. yellow: fr. black. Japan, Korea, China.

odoriferum: *B. æstivale.*

BERBERIDACEÆ. BARBERRY FAMILY. Ten genera of herbs and shrubs mostly in the north temp. zone, having alternate lvs., bisexual fls. solitary or in racemes, with sepals and petals usually imbricated in 2 rows, stamens as many as petals, superior 1-celled ovary, and fr. a berry or pod. Among the ornamental genera are Aceranthus, Achlys, Berberis, Caulophyllum, Diphylleia, Epimedium, Jeffersonia, Mahoberberis, Mahonia, Nandina, Podophyllum, Vancouveria, all plants for outdoor use.

BERBERIDOPSIS. *Flacourtiaceæ.* One partially climbing shrub from Chile, grown out-of-doors in S. Calif. Propagated by seeds, cuttings of green wood in spring, or layers in autumn. **B. corallina.** Lvs. alternate, cordate-ovate, to 3 in. long, coarsely sharp-toothed: fls. crimson, ⅓ in. long, in terminal many-fld. racemes: fr. a berry.

BERBERIS. BARBERRY. *Berberidaceæ.* Spiny shrubs with yellow wood, simple deciduous or evergreen lvs., turning bright colors in autumn, yellow fls., and fr. a red, yellow or black berry; native in northern hemisphere and also S. Amer.; the deciduous species are mostly hardy in the northern and central states and in S. Ont.

Barberries are widely grown for hedges and as specimen bushes for their general beauty and for the attractive flowers in spring and the fruits in autumn and winter. The evergreen species are not hardy in the northern states. The evergreen kinds do best in moist well-drained light loam, but the deciduous species may have drier soils. They are all of easy cultivation. Propagated by seeds which should be separated from the pulp, sown in autumn and they should germinate the following spring; by layers, cuttings of young wood in early June planted in sand in a shaded hotbed, and rare kinds by grafting on common stocks; sometimes suckers may be removed from the parent plant.

aggregata (*B. Geraldii*). SALMON B. Deciduous, to 10 ft., spines 3-parted: lvs. to 1 in. long, sharp-toothed: fls. pale yellow, in sessile panicles to 1½ in. long: fr. red, pruinose. W. China. Var. **Prattii** (*B. Prattii*) has longer often entire lvs. and longer panicles. Var. **recurvata** has lvs. often entire and panicles to 4 in. long.

amurensis. Deciduous, to 10 ft., spines 3-parted: lvs. to 3 in. long, densely ciliate-toothed: fls. in drooping racemes to 4 in. long: fr. bright red. N. E. Asia. Var. **japonica** (*B. Regeliana, B. Hakodate*) has broader lvs. and shorter racemes. Japan, Korea.

Aquifolium: *Mahonia Aquifolium.*

aristata (*B. floribunda. B. petiolaris*). Deciduous, to 10 ft., spines simple or 3-parted: lvs. to 2¼ in. long, spiny-toothed or entire: fls. bright yellow, in racemes to 4 in. long: fr. red or purple, pruinose. Himalayas.

asiatica. HIMALAYAN B. Evergreen, to 10 ft., with small spines: lvs. to 3 in. long, toothed or entire, whitish beneath: fls. in racemes to 2 in. long: fr. purple. Himalayas; adaptable far S.

atrocarpa. Evergreen, to 6 ft.: lvs. narrow, to 3 in. long, coarsely spiny-toothed: fls. in clusters of 6–12: fr. jet-black. W. China.

Bealei: *Mahonia Bealei.*

Bergmanniæ. Evergreen, to 6 ft.: lvs. to 1½ in. long, coarsely toothed: fls. in clusters: fr. black, pruinose on reddish stalks. W. China. Var. **acanthophylla** has longer lvs.

brachybotrys: the plant in cult. under this name is probably a form of *B. vulgaris.*

brevipaniculata. Deciduous. to 6 ft., spines 3-parted: lvs. to 1¼ in. long, entire or nearly so, glaucous beneath: fls. pale yellow, in short panicles: fr. red, pruinose. W. China.

buxifolia (*B. dulcis*). MAGELLAN B. Evergreen, to 10 ft., spines 3-parted or simple: lvs. to 1 in. long, entire: fls. orange-yellow, solitary: fr. dark purple. Chile. Var. **nana** is dwarf and compact, and var. **pygmæa** dwarf, tufted, unarmed.

canadensis. ALLEGHENY B. Deciduous, to 6 ft., spines 3-parted: lvs. to 2 in. long, toothed, grayish-white beneath: fls. bright yellow, in racemes to 1¾ in. long: fr. scarlet. Va. to Ga. and Mo.

cerasina: a name of uncertain botanical standing.

chilensis. Spines brown, 3-parted: lvs. shorter than spines, stiff and thick, broad-obovate to obovate-cuneate, coarsely spiny-toothed, glaucous underneath: fls. many, in nodding racemes: fr. globose, black, pruinose. Chile.

chinensis (*B. sinensis* of some. *B. serotina. B. spathulata*). Deciduous, to 10 ft., spines simple or 3-parted: lvs. to 1½ in. long, nearly entire, pale beneath: fls. in racemes to 3 in. long: fr. dark red. Caucasus.

congestiflora var. **hakeoides**: *B. hakeoides.*

cretica. Deciduous, to 3 ft. or procumbent, spines 3-parted: lvs. about ¾ in. long, entire: fls. in short 2–7-fld. racemes: fr. purple-black. Greece; not hardy N.

Darwinii. Evergreen, to 10 ft., spines 3–7-parted: lvs. to 1 in. long, spiny-toothed, glossy dark green above, paler beneath: fls. orange-yellow, in drooping racemes to 4 in. long: fr. dark purple. Chile; adaptable only far S. and Calif.

diaphana. KANSU B. Deciduous, to 6 ft., spines simple or 3-parted: lvs. to 1¼ in. long, toothed or entire, glaucous beneath: fls. bright yellow, solitary or in clusters of 2–5: fr. red, slightly pruinose. W. China.

dictyophylla. CHALKLEAF B. Deciduous, to 6 ft., spines 3-parted: lvs. to 1 in. long, entire or toothed, white beneath: fls. pale yellow, solitary: fr. red. China.

dictyota: a form of *Mahonia Aquifolium.*

Dielsiana. Deciduous, to 10 ft., spines simple or 3-parted: lvs. to 2 in. long, entire or toothed: fls. in racemes to 3 in. long: fr. bright red. W. China.

dulcis: *B. buxifolia*; also a form of *B. vulgaris.*

elegans: *B. Lycium.*

elegantissima: listed name.

emarginata. Hybrid between *B. vulgaris* and *B. sibirica*, with fls. in dense racemes and deep red frs.

empetrifolia. CROW B. Evergreen, to 2 ft., branches often prostrate, spines simple or 3-parted: lvs. linear, to ¾ in. long, entire, spiny-pointed: fls. golden-yellow, solitary or in 2's: fr. bluish-black. Chile.

fascicularis: *Mahonia pinnata.*

Fendleri. Deciduous, to 4 or 5 ft., with red-brown branchlets: lvs. obovate to oblanceolate, acute, to 1½ in. long, sometimes spinulose: fls. yellow tinged red outside, 6–10 in slender racemes. Colo., New Mex.

floribunda: *B. aristata.*

formosiana: unidentified hort. name.

Fortunei: *Mahonia Fortunei.*

Fremontii: *Mahonia Fremontii.*

fuchsioides: hort. name, probably a form of *B. vulgaris.*

Gagnepainii. Evergreen, to 6 ft., spines 3-parted: lvs. narrow-lanceolate, to 4 in. long, spiny-toothed, pale beneath: fls. bright yellow, in clusters: fr. bluish-black, pruinose. W. China.

Geraldii: *B. aggregata.*

Gilgiana. Deciduous, to 6 ft., spines 3-parted: lvs. to about 2 in. long, toothed, pubescent: fls. bright yellow, in racemes to 1 in. and more long: fr. deep red. China.

globularis: hort. name, probably a form of *B. vulgaris.*

hakeoides (*B. congestiflora* var. *hakeoides*). CHILEAN B. Evergreen, to 12 ft., spines small: lvs. nearly orbicular, to 1 in. long, spiny-toothed: fls. in dense clusters: fr. bluish-black. Chile.

Hakodate: *B. amurensis* var. *japonica.*

heterophylla. Half-evergreen, to 5 ft., spines 3–7-parted: lvs. to 1 in. long, entire or with large spiny teeth: fls. solitary: fr. black, pruinose. Chile.

heteropoda. TURKESTAN B. Deciduous, to 6 ft., spines simple or 3-parted or wanting: lvs. to 2 in. long, entire or finely toothed, bluish-green: fls. orange-yellow, in short racemes, fragrant: fr. black, pruinose. Turkestan.

Hookeri. Evergreen: lvs. to 3 in. long, spiny-toothed, white beneath: fls. clustered: fr. black-purple. Himalayas. Var. **viridis** is listed.

ilicifolia. HOLLY B. Evergreen, to 8 ft.: lvs. to 2 in. long, spiny-toothed at apex: fls. orange-yellow, in short racemes. S. Chile.—The plant cult. as *B. ilicifolia* is usually *Mahoberberis Neuberti* var. *latifolia.*

insignis. Evergreen, to 6 ft., spines few: lvs. to 5 in. long, spiny-toothed, glossy: fls. golden-yellow, in clusters: fr. black. Himalayas; hardy only far S.

Jacquini: *B. vulgaris.*

japonica: *B. Thunbergii* or *Mahonia Bealei;* see also *Mahonia japonica.*

Julianæ. WINTERGREEN B. Evergreen, to 6 ft., spines 3-parted: lvs. to 3 in. long, spiny-toothed: fls. in clusters: fr. bluish-black, pruinose. China.

Knightii: *B. xanthoxylon.*

koreana. Deciduous, to 6 ft., spines mostly simple: lvs. to 3 in. long, toothed, pale beneath: fls. in racemes 1 in. and more long: fr. bright red. Korea.

latifolia: *Mahoberberis Neuberti* var. *latifolia.*

Lawsoniana: hort. name probably belonging to *B. stenophylla.*

laxiflora. Hybrid between *B. vulgaris* and probably *B. chinensis*, with fls. in racemes to 4 in. long.

Liechtensteinii: *B. Potanini.*

Lycium (*B. elegans*). Half-evergreen, to 10 ft., spines 3-parted: lvs. to 2 in. long, entire or toothed: fls. bright yellow, usually in racemes to 4 in. long: fr. purple, pruinose. Himalayas; adaptable only far S.

macracantha. Hybrid between *B. aristata* and *B. vulgaris:* to 10 ft. or more: lvs. mostly obovate, somewhat spinose-serrate: racemes with 10–20 fls.

nepalensis: *Mahonia nepalensis.*

nervosa: *Mahonia nervosa.*

Neuberti: *Mahoberberis Neuberti.*

Nevinii: *Mahonia Nevinii.*

orthobotrys. Similar to *B. vulgaris*, but the fls. somewhat corymbose and differing in technical characters. Persia.

parvifolia. Half-evergreen, low, spines 3-parted: lvs. to ½ in. long, spiny-toothed or entire, pale beneath: fls. in dense clusters: fr. red, pruinose. W. China.

petiolaris: *B. aristata.*

pinnata: *Mahonia pinnata.*

Poiretii. Deciduous, to 6 ft., spines simple, small: lvs. to 1½ in. long, entire, bright green above, pale beneath: fls. bright yellow, in racemes: fr. bright red. N. China, Siberia.

Potanini (*B. Liechtensteinii*). Deciduous, spines simple or 3-parted: lvs. to 2½ in. long, spiny-toothed, white beneath: fls. in racemes to 1½ in. long: fr. red. W. China.

Prattii: *B. aggregata* var.

pruinosa. Evergreen, to 10 ft., spines 3-parted: lvs. to 2 in. long, spiny-toothed, glossy dark green above, white beneath: fls. in clusters: fr. bluish-black, pruinose. China.

Regeliana: *B. amurensis* var. *japonica.*

repens: *Mahonia repens.*

replicata. Evergreen, branchlets yellowish: lvs. to 1¼ in. long, margins revolute: fr. scarlet, turning black. China.

Sargentiana. Evergreen, to 6 ft., spines 3-parted: lvs. to 4 in. long, spiny-toothed, pale beneath: fls. in clusters: fr. bluish-black. China.

serotina: *B. chinensis.*

sibirica. Deciduous, to 2 ft., spines 3–11-parted: lvs. to 1 in. long, spiny-toothed: fls. solitary or in 2's, nodding: fr. red. Siberia.

Sieboldii. Deciduous, to 5 ft., spines 3-parted: lvs. to 2½ in. long, ciliate-toothed: fls. pale yellow, in few-fld. racemes: fr. bright red. Japan.

sinensis: *B. chinensis, B. Thunbergii.*

spathulata: *B. chinensis.*

Stapfiana: *B. Wilsonæ* var.

stenophylla. Hybrid between *B. Darwinii* and *B. empetrifolia*: lvs. narrow-lanceolate, to 1 in. long, revolute at margins, dark green above, pale beneath: fls. golden-yellow, in clusters: fr. black, pruinose.

subcaulialata: *B. Wilsonæ* var.

Swaseyi: *Mahonia Swaseyi.*

Thunbergii (*B. japonica. B. sinensis* of some). JAPANESE B. Deciduous, to 8 ft., spines mostly simple: lvs. variable, to 1¼ in. long, entire: fls. solitary or in clusters: fr. bright red. Japan; hardy and popular. Var. **atropurpurea** has bronzy-red foliage. Var. **lutea** has yellow frs. Var. **Maximowiczii** has acute rather than obtuse lvs. Vars. **minor** and **nana** are low forms.

triacanthophora. Evergreen, to 5 ft.: lvs. narrow, to 2 in. long, toothed, glaucous beneath: fls. whitish, in clusters: fr. blue-black. China.

trifoliolata: *Mahonia trifoliolata.*

Vernæ. Deciduous, to 6 ft., spines simple: lvs. variable, to 1 in. long, entire: fls. in dense racemes to 1½ in. long: fr. red. China.

verruculosa. Evergreen, to 3 ft., spines 3-parted: lvs. to 1 in. long, spiny-toothed, margins revolute, glossy dark green above, glaucous beneath: fls. golden-yellow, solitary or in 2's: fr. black, pruinose. W. China.

virescens. Deciduous, to 10 ft., spines simple or 3-parted: lvs. to 1 in. long, toothed or entire, glaucous beneath: fls. pale yellow, in few-fld. racemes: fr. purple, pruinose. Himalayas.

vulgaris (*B. Jacquini*). EUROPEAN or COMMON B. Deciduous, to 8 ft., spines 3-parted: lvs. to 2 in. long: fls. in racemes to 2 in. long: fr. red or purple. Eu.; nat. in N. Amer.—A host of the wheat rust. Hort. vars. are: **alba**, fr. whitish; **albo-variegata**, lvs. variegated with white; **argenteo-marginata**, margins of lvs. white; **aureo-marginata**, margins of lvs. yellow; **atropurpurea** (var. *purpurea*), lvs. deep purple; **dulcis** (*B. dulcis*), fr. sweet; **lutea**, fr. bright yellow.

Wallichiana. Evergreen, to 10 ft.: lvs. to 4 in. long, spiny-toothed, pale beneath: fls. in clusters: fr. black. Himalayas.

Wilsonæ. Deciduous or half-evergreen, to 6 ft., spines 3-parted: lvs. to 1 in. long, entire, glaucous beneath: fls. golden-yellow, in dense clusters or panicles: fr. salmon-red. W. China. Var. **Stapfiana** (*B. Stapfiana*) has infl. of 4–7 fls. Var. **subcaulialata** (*B. subcaulialata*) has lvs. whitish beneath and sometimes with few teeth, and strongly angled branchlets.

xanthoxylon (*B. Knightii*). Evergreen, spines 3-parted: lvs. to 4 in. long, spiny-toothed: fls. in clusters: fr. black. Java; hardy only far S.

BERCHEMIA. *Rhamnaceæ.* Twining deciduous shrubs bearing alternate entire lvs. having conspicuous parallel veins, small fls. in terminal panicles, and drupaceous fr.

The species thrive in any soil but are not reliable far North. Propagated by seeds and root-cuttings in spring or by layers and cuttings of ripe wood in autumn.

racemosa. Lvs. ovate, subcordate at base, to 2½ in. long, somewhat glaucous underneath: fls. greenish, the panicles to 6 in. long: fr. red turning black, to ¼ in. long. Japan, Formosa.

scandens (*B. volubilis*). Supple-Jack. Climbing to 15 ft. or more: lvs. elliptic to oblong-ovate, rounded at base: fls. greenish-white, in panicles to 1½ in. long: fr. bluish-black. Low woods, Va. and Ky. to Fla. and Tex.

volubilis: *B. scandens*.

BERGAMOT: *Citrus Bergamia*. Wild: *Monarda fistulosa*.

BERGENIA (*Megasea*). *Saxifragaceæ*. Per. herbs with thick rootstocks from which the plants develop into large low clumps or colonies: lvs. large, thick, wavy, entire or toothed and with gland-bearing pits, the petioles sheathed at base: fls. large, pink or white, in spring, on scapes. The lvs. are ornamental and more or less evergreen. Cult. as for *Saxifraga*, the first two hardy N.

cordifolia (*Saxifraga cordifolia*). To 20 in.: lvs. fleshy, orbicular-cordate, margin wavy-toothed, smooth and shining: fls. clear rose, in dense nodding cymes, on thick shiny scapes, partly hidden in the lvs. Siberia. Var. **purpurea**, panicles taller, fls. deep reddish-purple.

crassifolia (*Saxifraga crassifolia*). To 20 in.: lvs. smooth and shining, obovate, slightly toothed or entire: fls. rose, lilac or purple, in dense panicles standing well above the lvs. Siberia, Mongolia. Var. **orbicularis** (*S. orbicularis*) has broad lvs. and rose fls.

ligulata (*Saxifraga ligulata*). To 1 ft.: lvs. obovate or orbicular, cordate at base, margins entire, ciliate: fls. white, rose or purplish, nodding, in racemes. Himalayas. Var. **Leichtlinii** has crimson lvs. and rose fls.

purpurascens (*Saxifraga purpurascens*). To 1 ft.: lvs. obovate or oblong, to 3 in. long, wavy-margined: fls. purple, nodding, in few-fld. panicles on purplish scapes. India.

Stracheyi (*Saxifraga Stracheyi*). To 1 ft.: lvs. obovate, margins ciliate: fls. pink or rose, in branching panicles. India.

BERGERANTHUS. *Aizoaceæ*. A few S. African plants formerly included in Mesembryanthemum (which see for cult.), nearly or quite stemless: lvs. standing cross-wise and more or less connate at base, somewhat glaucous and often dotted: fls. long-stalked; stigmas mostly 5. **B. multiceps** (*M. multiceps*) is a stemless and tufted per.: lvs. flat above and keeled underneath, to 1½ in. or more long, shining green: fls. yellow, 1–5 on a somewhat compressed scape.

BERGEROCACTUS. *Cactaceæ*. One species in extreme S. Calif. and Lower Calif., a segregate from Cereus: fls. with scale-bearing ovary: plant making colonies or patches, the branches cylindric or columnar, closely many-ribbed, with many yellow sharp spines: fls. small, pale yellow: roots somewhat tuberous. See *Cacti*. **B. Emoryi** (*Cereus* and *Echinocereus Emoryi*). Making large colonies or patches: branches or sts. erect, to 2 ft. and 2 in. or more diam.: fls. about ¾ in. long and broad, diurnal. Sometimes planted in gardens in its native regions and in the trade for that purpose.

BERLANDIERA. *Compositæ*. Per. hairy herbs with alternate lvs. and heads solitary or in corymbs, of yellow ray- and disk-fls.; pappus none or of awns; native in S. U. S. and Mex.; sometimes transferred to grounds. They bloom in spring and summer.

lyrata. To 8 in., white-pubescent: lvs. lyrate-pinnatifid: heads solitary, 1 in. across. Plains, Kans. to Mex.

BERRY: pulpy, indehiscent, few- or many-seeded fruit; technically, the pulpy fruit resulting from a single pistil, containing 1 or more seeds but no true stone. Botanically, fruits of eggplant, tomato, grape are berries, but in pomology the term is commonly restricted to the bush-fruits, as currant, gooseberry, cranberry; blackberry, raspberry, strawberry, are not true berries.

BERSEEM: *Trifolium alexandrinum*.

BERTEROA. *Cruciferæ*. A few species of ann. or per. herbs in Eu. and Asia, differing from Alyssum in the thick pods or silicles, and 2-cleft petals; one is sometimes grown in sunny places for ornament. **B. incana** (*Alyssum incanum*) is bien., strict, to 2 ft., grayish or hoary: lvs. oblong or lanceolate, to 2 in. long: fls. white, in terminal elongating racemes. Eu.; nat. in N. Amer.

BERTHOLLETIA. *Lecythidaceæ*. Large trop. American trees furnishing commercial Brazil- or Para-nuts, also called "Castanea," mostly the product of **B. excelsa**. To 100 ft.: lvs. oblong, leathery, to 2 ft. long, wavy-margined: fls. cream-colored, in spike-like racemes: fr. to 6 in. across, the dark brown walls thick and hard, containing 18–24 triangular nuts with single kernel. Brazil, Venezuela, Guiana.—Suited only for trop. climates, but small specimens are likely to be seen in collections of economic plants under glass. Propagated by seeds or layers.

BERTOLONIA. *Melastomaceæ*. Mostly Brazilian dwarf or creeping herbs with simple 3–9-nerved lvs., white, rose or purple fls. in racemes, and capsular fr.

Grown in greenhouses for the attractive foliage, which is purplish underneath and with various metallic colors above. They thrive in dense shade and a humid atmosphere. Propagated by cuttings over heat and by seeds.

maculata. Lvs. broadly ovate, hairy, velvety-green above, the veins bordered with purple or magenta band: fls. rose.

marmorata. Lvs. ovate-oblong, slightly hairy, streaked with white along veins: fls. purple. Var. **ænea** has coppery tinged lvs. only slightly spotted.

pubescens. Lvs. ovate, with long white hairs and chocolate-colored band down center. Ecuador.

Sanderiana: hort. name; probably a form of *B. maculata*.

BESSERA ELEGANS: see *Milla*.

BESSEYA: *Synthyris plantaginea*.

BETA. Beet. *Chenopodiaceæ*. Herbs with alternate lvs. and small greenish or reddish fls. in panicled spikes, one widely grown for the edible roots and lvs. **B. vulgaris**. Beet. Beet-Root. Sugar-Beet. Mangel. Bien. or ann. to 4 ft., with thick roots of various sizes, forms and colors, and ovate to oblong-ovate lvs. Cultigen. Var. **Cicla**, Leaf-Beet, has much larger lvs. and no fleshy root, in Swiss chard the midribs much enlarged. Grown as a pot-herb and sometimes for the ornamental colored foliage.

Beets are of easy cultivation in any good garden soil. Seeds may be sown early in spring and at intervals of a few weeks throughout the summer to insure a steady crop. For very early use seeds may be sown in boxes or hotbeds in February and March and transplanted to the open when frost is out of the ground. Beets sown in late summer may be dug before cold weather and stored in the cellar in barrels, packed in earth or sphagnum. The long-rooted varieties should be planted only in open well-tilled soil, else they will become misshapen.

BETONICA: *Stachys.*

BETONY: *Stachys.* **Wood-:** *Pedicularis.*

BETULA. Birch. *Betulaceæ.* Deciduous monœcious trees and shrubs native in the northern hemisphere, with alternate toothed lvs. and unisexual fls. borne in catkins, the staminate showing in autumn and remaining naked during the winter and opening in spring, the pistillate becoming cone-like with 3-lobed scales; cult. for ornament and for the timber which is used for making furniture and other articles. They inhabit lowlands, sandy or light-soil regions and mountains.

Birches are mostly short-lived trees suitable for northern climates. They thrive on moist sandy soil or some species in drier locations. Propagated by seeds sown at once or stratified, in sandy soil which is kept moist and shady. Seedlings should be transplanted when about one year old. Other methods of propagation are by layers, greenwood cuttings under glass, and grafting or budding or seedling stocks.

alba: the material cult. under this name may be either *B. pendula* or *B. pubescens.*

Bhojpattra: *B. utilis.*

costata. Tree to 100 ft., with flaking papery bark: lvs. ovate, to 3 in. long, long-acuminate: cones ellipsoid, ¾ in. long. N. E. Asia.

cylindrostachya. Tree to 60 ft.: lvs. ovate-oblong, to 6 in. long, slightly pubescent beneath: cones to 3½ in. long. Himalayas.

Ermani. Tree to 60 ft.: lvs. triangular-ovate, to 4 in. long: cones oblong, about 1 in. long. N. E. Asia, Japan.

excelsa: *B. lutea.*

fastigiata: *B. pendula* var.

fontinalis (*B. occidentalis*). Water B. Shrubby tree to 40 ft.: lvs. broad-ovate, to 2 in. long: cones about 1 in. long. Alaska to Ore. and Colo.

fruticosa. Shrub to 15 ft.: lvs. ovate, to 2 in. long: cones oblong-cylindric, to 1 in. long. N. E. Asia.

glandulosa. Shrub to 6 ft.: lvs. nearly orbicular to obovate, to 1 in. long, pale beneath: cones cylindric, to ¾ in. long. N. Amer.

laciniata: *B. pendula* var. *dalecarlica.*

lenta. Cherry or Sweet B. Tree to 75 ft.: lvs. oblong-ovate, to 5 in. long, when young silky-pubescent beneath: cones ovoid-oblong, to 1½ in. long. Me. to Ala., in moist woods.

lutea (*B. excelsa*). Yellow B. Tree to 90 ft., with flaking yellowish or silvery bark: lvs. ovate, to 5 in. long, glabrous or pubescent beneath: cones oblong, about 1 in. long. Newf. to Ga. and Tenn., mostly in moist woods.

macrophylla: *B. papyrifera* var. *grandis.*

Maximowicziana. Monarch B. Tree to 100 ft., the bark flaking: lvs. broad-ovate, to 6 in. long, heart-shaped at base: cones cylindric, to 3 in. long. Japan

nana. Spreading branching shrub to 2 ft.: lvs. orbicular, to ½ in. long, when young sticky and pubescent beneath: cones ½ in. or less long. N. Asia, N. Eu., Alaska.

nigra (*B. rubra*). River or Black B. Tree to 100 ft., with flaking papery bark: lvs. rhombic-ovate, to 3 in. long, whitish below: cones oblong-cylindric, 1½ in. long. Mass. to Fla. and Kans., by streams and in bottom-lands.

occidentalis: the trade name may refer either to *B. fontinalis* or to *B. papyrifera* var. *occidentalis.*

papyracea: *B. papyrifera.*

papyrifera (*B. papyracea*) Canoe or Paper B. Tree to 100 ft., with white exfoliating bark: lvs. ovate, to 4 in. long: cones cylindric, to 2 in. long. N. N. Amer., in light and rocky lands. Var. **grandis** (*B. macrophylla*) has large heart-shaped lvs. Var. **occidentalis** (var. *Lyalliana*) has orange or dark brown bark. B. C. to Mont.

pendula (*B. verrucosa*). European White B. Tree to 60 ft., with white bark peeling off in layers, the branches usually drooping: lvs. rhombic-ovate, to 2½ in. long: cones cylindric, about 1 in. long. Eu., Asia Minor. Some of the hort. vars. are: **dalecarlica** (*B. laciniata*), lvs. deeply lobed; **fastigiata**, of columnar habit; **gracilis** (*B. alba elegans laciniata*), branches drooping, lvs. finely dissected; **purpurea** (*B. alba atropurpurea*), lvs. purple; **tristis**, branches drooping and forming a round head; **Youngii**, head irregular, branches drooping and very slender.

populifolia. Gray B. Tree to 30 ft., with chalky bark: lvs. triangular-ovate, to 3 in. long, shining above: cones cylindric, about 1 in. long. N. S. to Del., on light lands. Var. **laciniata** has pinnately lobed lvs., **pendula** drooping branches, and **purpurea** purple young lvs.

pubescens. Tree to 60 ft., with white peeling bark: lvs. ovate, to 2 in. long, usually pubescent beneath: cones cylindric, 1 in. long. Eu., Siberia. Var. **urticifolia** (*B. urticifolia*) has lvs. coarsely toothed or lobed. Var. **variegata** has variegated foliage.

pumila. Shrub to 15 ft.: lvs. orbicular to obovate, about 1 in. long, when young densely pubescent beneath: cones cylindric-oblong, 1 in. long. Newf. to N. J. and Minn., in bogs.

rubra: *B. nigra.*

urticifolia: *B. pubescens* var.

utilis (*B. Bhojpattra*). Tree to 60 ft., with flaking dark brown bark: lvs. ovate, to 3 in. long, pubescent beneath: cones cylindric, 1 in. long. Himalayas.

verrucosa: *B. pendula.*

BETULACEÆ. Birch Family. Six genera of deciduous mostly monœcious trees and shrubs, in the north temp. zone, having alternate simple lvs., staminate fls. in long drooping catkins, pistillate in short catkins or clusters, 2–10 stamens in the axils of bracts, 2-celled ovary, and fr. a small nut-like body. The family furnishes many ornamental subjects, valuable timber, some edible nuts, bark used for making canoes and writing paper. Alnus, Betula, Carpinus, Corylus and Ostrya are best known to hort.

BIANCÆA: *Cæsalpinia.*

BICUCULLA: *Dicentra.*

BIDENS. Bur-Marigold. Stick-Tights. Tickseed. *Compositæ.* Herbaceous ann. and per. mostly weedy plants, with opposite toothed, cut or divided lvs. and solitary or clustered heads, the rays white or yellow when present, the disk yellow; pappus of stiff bristles. Some species are grown from seed for ornament in the flower-garden; they are closely allied to Cosmos. Native wild species are weedy, mostly in moist places.

atrosanguinea: *Cosmos diversifolius.*

dahlioides: *Cosmos diversifolius.*

ferulæfolia. Fern-leaved B. Ann., branching: lvs. 2-pinnate into narrow segms.: heads corymbose, less than 1 in. across; rays and disk bright yellow. Mex.

grandiflora. To 4 ft., somewhat glaucous, branched: lvs. pinnately divided into narrow segms.: heads golden-yellow. Mex.

humilis. Dwarf, almost procumbent: lvs. irregularly 2-pinnately 5-parted, segms. narrow: heads yellow, solitary. Ecuador.

trichosperma (*Coreopsis trichosperma*). Ann. or bien. to 5 ft.: lvs. pinnately cut into lanceolate or linear segms.: heads to 2½ in. across, rays golden-yellow. Mass. to Ga. and Ky.

BIENNIALS (abbreviated bien. in this book) are plants that live two years from seed, blooming only or mostly the second year. Some of the perennials are so short-lived that they become practically biennial in cultivation and may be so listed. Examples of plants that are actually or essentially biennial are common forms of red clover, parsnip, cabbage, foxglove, Canterbury bells, hollyhock, verbascums, snapdragon, pansy. Of most ornamental kinds, bloom may be obtained from seeds sown the previous midsummer, the seedlings being handled promptly to insure continuous growth. As a class, biennials require no special culture differing from that of other plants.

BIFRENARIA. *Orchidaceæ.* S. American epiphytes with pseudobulbs bearing 1 leathery lf. and fls. in racemes, the sepals and petals similar, the lip usually 3-lobed and with a callus or ridges; suited to a temperate or cool greenhouse. See *Orchids.*

atropurpurea. Pseudobulbs to 3 in. high, bearing a linear-lanceolate lf. to 10 in. long: fls. about 2 in. across, very fragrant, in 3–5-fld. racemes to 3 in. long, the sepals and petals wine-red with yellow center, the lip entire, whitish tinged with rose, with linear callus, June. Brazil.

aurantiaca (*Lindleyella aurantiaca*). Pseudobulbs to 2 in. high, bearing 1 plaited lf. to 6 in. long and 2 in. wide: fls. in 7–12-fld. racemes to 8 in. long, yellow spotted with purple, the lip spurred and with a lighter callus between the side lobes, Sept.–Oct. Trinidad, Guiana.

Harrisoniæ (*Lycaste Harrisoniæ*). Pseudobulbs to 3 in. high, bearing a narrow-elliptic lf. to 1 ft. long: fls. about 2¾ in. across, in short 2–3-fld. racemes, the sepals and petals yellowish tinged with red, the lip violet-red with yellow hairy callus, the base of the column prolonged into a spur-like part to 1½ in. long, Mar.–May. Brazil.

BIGNAY: *Antidesma Bunius.*

BIGNONIA. *Bignoniaceæ.* One evergreen climbing shrub with lvs. of 2 lfts. and a terminal tendril, funnelform fls. in axillary cymes, and linear flattened frs. The genus is variously understood, but is here considered to have only one species. It is grown as a wall cover in the S. and sometimes in the greenhouse. Propagated by cuttings, and by seeds when available.

æquinoctialis: *Cydista æquinoctialis.*

alliacea: *Adenocalymna alliaceum.*

argyreo-violescens. Hort. name for a foliage plant with ovate purple lvs. becoming variegated with white. —The genus is uncertain, but not a true Bignonia.

atropurpurea, atrosanguinea: *B. capreolata* var.

australis: *Pandorea pandorana.*

buccinatoria: *Phædranthus buccinatorius.*

capreolata (*Anisostichus* and *Doxantha capreolata*). Trumpet-Flower. Cross-Vine. Climbing to 50 ft.: lfts. ovate or oblong, to 6 in. long, entire: fls. yellow-red, paler within, 2 in. long: caps. to 7 in. long. Fields, Va. and Ill., to Fla. and La., but root-hardy farther N. Kinds with fls. in darker colors are known as *B. atropurpurea* and *B. atrosanguinea.*

Chamberlaynii: *Anemopægma Chamberlaynii.*

Cherere: *Phædranthus buccinatorius.*

chinensis: *Campsis chinensis.*

grandiflora: *Campsis chinensis.*

jasminoides: *Pandorea jasminoides.*

Mackenii: *Pandorea Ricasoliana.*

Princei: *Campsis hybrida.*

purpurea: *Clytostoma purpureum.*

radicans: *Campsis radicans.*

serratifolia: *Tabebuia serratifolia.*

speciosa: *Clytostoma callistegioides.*

stans: *Stenolobium stans.*

Tweediana: *Doxantha Unguis-cati.*

Unguis-cati: *Doxantha Unguis-cati.*

venusta: *Pyrostegia ignea.*

violacea. Lfts. oval, 4 in. long: fls. violet, 1 in. long, in terminal branched panicles. Bolivia.—Undoubtedly not a true Bignonia, but genus undetermined.

BIGNONIACEÆ. Bignonia Family. About 100 widely distributed genera of trees, shrubs, vines, and herbs, with mostly opposite simple or compound lvs. which are often even-pinnate, showy, more or less irregular gamopetalous fls. in racemes or panicles, having 5-lobed corolla-limb, 5 stamens of which 1 or 3 are sterile, superior 1–2-celled ovary, and fr. a long caps. or pod with winged seeds. Many genera are cult. for ornament, as Adenocalymna, Amphicome, Anemopægma, Bignonia, Campsidium, Campsis, Catalpa, Chilopsis, Clytostoma, Crescentia, Cydista, Delostoma, Distictis, Dolichandra, Doxantha, Eccremocarpus, Incarvillea, Jacaranda, Kigelia, Oroxylon, Pandorea, Parmentiera, Phædranthus, Pithecoctenium, Pyrostegia, Radermachia, Spathodea, Stenolobium, Tabebuia, Tecoma, Tecomaria. Most of the bignoniads are native in warm-temp. and trop. regions.

BIHAI: *Heliconia.*

BIKUKULLA: *Dicentra.*

BILIMBI: *Averrhoa Bilimbi.*

BILLARDIERA. *Pittosporaceæ.* Small Australian shrubs with twining branches, alternate lvs., and mostly yellow or purple fls. solitary or clustered; grown under glass or out-of-doors in mild climates. Propagated by cuttings under glass or by seeds.

longiflora. Lvs. varying from ovate to linear, to 1½ in. long, entire: fls. greenish-yellow or becoming purple, solitary, drooping: berries blue.

BILLBERGIA. *Bromeliaceæ.* Stemless epiphytic herbs native in trop. Amer., having stiff lvs. in rosettes or clusters, and showy mostly blue fls. in spikes or panicles; grown for ornament and as oddities under glass or as house-plants. For cult., see *Bromeliaceæ.*

Forgetiana. Lvs. green banded with white. Of uncertain botanical standing.

Liboniana. Lvs. to 2 ft. long and 1½ in. wide, with small spiny teeth: fls. in an erect simple spike on scapes to 1 ft. long, with red sepals and blue-tipped petals. Brazil.

Morelii. Lvs. to 2 ft. long and 2 in. wide, with small spiny teeth: fls. in drooping spikes on scapes to 1 ft. long, with long red bract-like lvs., red sepals and blue-tipped petals. Brazil.

nutans. Lvs. to 1½ ft. long and ½ in. wide, finely toothed: fls. few on scapes to 1 ft. long, drooping, with bright red bracts and green petals edged with blue. Brazil.—One of the commonest in cult.

pyramidalis (*B. thyrsoidea*). Lvs. to 3 ft. long and 2½ in. wide, finely spiny-toothed: fls. in dense spikes to 4 in. long, with bright red bracts and red petals tipped with violet. Brazil.

rhodocyanea: *Æchmea fasciata.*

Sanderiana. Lvs. leathery, about 1 ft. long, spiny-toothed: panicles loose, to 10 in. long, on nodding scapes; sepals tipped with blue; petals blue with yellowish-green claw; bracts rose. Brazil.

speciosa. Lvs. to 2 ft. long, spiny-toothed, striped on back: fls. pale green tipped with blue, bracts rose, in loose drooping clusters. Brazil.

thyrsoidea: *B. pyramidalis.*

zebrina. Lvs. to 3 ft. long and 3 in. wide, prickly-toothed, spotted and banded with white: fls. in spikes on drooping scapes shorter than lvs., with pink or salmon bracts and green or yellowish-green fls. Brazil.

BILTIA: *Rhododendron Vaseyi.*

BINDWEED: *Convolvulus.*

BIOTA: *Thuja orientalis.*

BIRCH: *Betula.*

BIRD-OF-PARADISE FLOWER: *Strelitzia.*

BIRDS-EYES: *Gilia tricolor.*

BIRTHWORT: *Aristolochia.*

BISCHOFIA. *Euphorbiaceæ.* One evergreen or somewhat deciduous tree native in trop. Asia, sometimes planted in extreme S. U. S. **B. javanica** (*B. trifoliata*). Toog. To 75 ft.: lvs. alternate, of 3 ovate-acuminate bronzy-green serrulate lfts. to 5 in. long: fls. small, greenish, diœcious, without petals, in many-fld. racemes not exceeding the lvs.: fr. berry-like, brown or reddish or blue-black, size of a pea.

BISCUTELLA. *Cruciferæ.* A few ann. and per. herbs of the Old World, one sometimes planted for ornament, interesting for the 2 circular winged lobes of the flat pods or silicles: radical lvs. large, entire, toothed or pinnatifid: sts. mostly slender-branching: fls. small, yellow. **B. lævigata** is per., to 2 ft., hairy in lower part: lvs. variable, the radical ones long-oblong and toothed and forming rosette: fls. in terminal racemes, in spring and summer: pods about ⅓ in. across. Cent. and S. Eu.

BISHOPS-CAP: *Mitella.*

BISHOPS-HOOD: *Astrophytum myriostigma.*

BISHOPS-WEED: *Ægopodium Podagraria.*

BISMARCKIA. *Palmaceæ.* Heavy diœcious fan-palm of Madagascar, allied to Latania and Hyphæne, known somewhat to cult.; from the former it differs in bearing staminate and pistillate fls. on similar spadices, and from Hyphæne in characters of fr. and seed and in the fact that the trunk is always columnar and unbranched: spadices among the lvs. **B. nobilis.** To 30 ft. (perhaps more), ringed with scars, bearing a heavy crown: lvs. 3 ft. or more across, regularly divided to middle or below into many bluish-green segms. deeply bifid at apex, filament in the sinus; petiole finely serrate-denticulate along the sharp edges: fr. in drooping clusters, about 1½ in. diam., drupe-like, peduncled, with a single walnut-like seed 1 in. diam.

BISTORTA: *Polygonum.*

BITTERNUT: *Carya cordiformis.*

BITTER-ROOT: *Lewisia rediviva.*

BITTER-SWEET: *Solanum Dulcamara.* **False:** *Celastrus scandens.*

BIXA. *Bixaceæ.* A trop. American tree much planted in the tropics for the annatto dye which is extracted from the pulp around the seeds. **B. Orellana.** Annatto. To 20 ft. or more: lvs. ovate, to 7 in. long: fls. pink or rose, to 2 in. across: fr. reddish-brown, to 2 in. long, covered with soft spines.—Propagated by seeds and cuttings. Grown in S. Fla. and southward.

BIXACEÆ. Bixa Family. Two genera of trees and shrubs having alternate simple lvs., regular bisexual fls. with 5 sepals and petals, numerous stamens, superior 1-celled ovary, and capsular fr.: native in the warm parts of Amer. and Australia. Bixa is cult. for the annatto dye. See Cochlospermaceæ.

BLACK-BEAD: *Pithecellobium Unguis-cati.*

BLACKBERRY. The American pomological blackberry is a native fruit, having been developed from indigenous species. The species of wild blackberry are more numerous than formerly supposed and their identities are not yet clearly understood, and the exact parentage of the named horticultural varieties is mostly yet obscure. See *Rubus.*

The culture of the blackberry is limited by the cold winters of the northern and plains states and by drought and dry heat in the Southwest. Elsewhere it is grown in some of its forms, although nowhere does it assume great commercial importance. Almost any good soil will grow blackberries provided it is well drained and retentive of moisture with a good humus content. The heavier clay loams are preferred.

Propagation of varieties is by suckers which come up from the roots, and for more rapid increase by root-cuttings. Roots are cut into sections 2–3 inches long, buried in soil to callus during the winter, and planted in the nursery row in early spring. Some of the trailing or lopping sorts root at the tips of the canes. Planting is performed in the very early spring either in rows 7–8 feet apart, plants 2–3 feet apart in the row, or in hills 7 x 7 or 8 x 8 feet on the square.

Clean cultivation is essential for successful culture of blackberries on a large scale. Home plantings may be heavily mulched to keep down the weeds and retain moisture. Suckers outside the row or hill must be destroyed or the planting will become a thicket. Blackberries respond to the application of manure or complete fertilizer on poor soils. Care should be taken not to stimulate the plants to over-vegetative growth.

Pruning consists in cutting out the fruiting canes soon after the fruit is picked and thinning out the new canes in the early spring to space them about a foot apart in the row, or 5–6 to the hill. The canes are biennial, growing from the ground one year and fruiting the next year. Canes may be shortened back if very tall. Trailing kinds must be trained on a trellis.

For home use fruit should become soft-ripe on the plants. For market the berries should be black but still firm. Picking is by hand, the berries usually falling into the same quart berry baskets in which the fruit is marketed.

A good yield is about 2,000–3,000 quarts to the acre.

In choosing varieties, adaptation to climate is important. Varieties of more than average hardiness are Eldorado, Ancient Briton, Snyder, Hardy, Taylor, Wachusett, Minnewaski, Erie, Mersereau. Varieties adapted to regions south of New York are Nanticoke, Rathbun, Agawam, Dorchester, Early King, Lawton. Varieties for the far Southwest are Dallas, McDonald, Haupt. Varieties for the Pacific Coast include Jordan, Kittatinny, Himalaya, Erie, Mammoth, Evergreen, Lawton, Crandall. Varieties specially resistant to rust are Eldorado, Snyder, Taylor, Erie.

Care should be taken to plant only disease-free plants. If rust is prevalent the only remedy is to plant rust-resistant varieties. The commercial grower should give particular attention to special pest and disease problems.

BLACKBUTT: *Eucalyptus pilularis.*

BLACK-EYED SUSAN: *Rudbeckia hirta, Thunbergia alata.*

BLACKTHORN: *Prunus spinosa.*

BLADDER-NUT: *Staphylea.*

BLADDER-POD: *Vesicaria.*

BLADDERWORT: *Utricularia.*

BLADE: the expanded part of a leaf or petal.

BLANDFORDIA. *Liliaceæ.* Australian fibrous-rooted herbs with lvs. mostly near base of st., large drooping 6-lobed fls. in terminal racemes, and capsular frs.; adapted to mild climates. Propagated by seeds and sparingly by division of roots.

nobilis. To 3 ft.: lvs. to 1½ ft. long and ⅙ in. wide: fls. brownish-red tipped with yellow, to 1¼ in. long. New S. Wales.

BLAZING STAR: *Chamælirium luteum, Liatris, Mentzelia lævicaulis.*

BLECHNUM. *Polypodiaceæ.* Rather coarse ferns, with compound or deeply cut lvs.; sori in a line close to midrib of segms.

A few species are cultivated in greenhouses. Propagated by spores except in the species that develop plantlets at the ends of the creeping rhizomes. They require a rather dry atmosphere but plenty of moisture at the root, and a temperature of 60–65°; good as specimen plants. See *Ferns.*

brasiliense. With scaly trunk to 3 ft. high: lvs. to 3 ft. long and 15 in. wide, deeply pinnatifid, segms. finely toothed. Brazil, Peru.

fluviatile (*Lomaria fluviatilis*). Lvs. to 2½ ft. long and 1½ in. wide, simply pinnate, segms. to ¾ in. long, wavy-margined, sterile and fertile different. New Zeal., Australia.

gibbum (*Lomaria gibba*). With trunk to 5 ft. high: lvs. to 3 ft. long and 1 ft. wide, deeply pinnatifid, segms. finely toothed, the sterile and fertile different. New Caledonia, Aneiteum in S. Pacific.

Moorei (*Lomaria ciliata*). Trunk 6 in. high: lvs. to 1 ft. long, simply pinnate, toothed or lobed, the sterile and fertile different, sts. blackish. New Caledonia.

occidentale. Trunkless: lvs. to 1½ ft. long, simply pinnate, segms. to 3 in. long, entire. Trop. Amer.

orientale. Trunk stout, erect: lvs. to 5 ft. long and 3 ft. broad, simply pinnate, segms. to 8 in. long. Australia, China, Himalayas.

serrulatum. Saw-Fern. Lvs. to 2 ft. long and 15 in. wide, simply pinnate, segms. finely toothed, linear-oblong. Swamps, Fla. to Brazil.

spicant (*Struthiopteris* and *Lomaria spicant*). Deer-Fern. Sterile lvs. in crown surrounding fertile lvs., evergreen, to 3½ ft. long, simply pinnate, segms. entire or slightly toothed. Alaska to Calif., Eu., Asia.

BLEEDING-HEART: *Dicentra spectabilis.*

BLEPHARIGLOTTIS: *Habenaria.*

BLETIA HYACINTHINA: *Bletilla striata.*

BLETILLA. *Orchidaceæ.* Terrestrial orchids with tuberous rhizomes, rather thin lvs. and fls. in terminal racemes, the sepals and petals similar, the lip free and 3-lobed; sometimes planted out-of-doors. See *Orchids.*

hyacinthina: *B. striata.*

striata (*Bletia* and *Bletilla hyacinthina*). To 2 ft.: lvs. 3–5: fls. purple, 1½ in. long, in 3–7-fld. racemes longer than lvs., June. China, Japan.

BLIGHIA. *Sapindaceæ.* One tree native in W. Afr. but now cult. and nat. widely in the tropics, producing edible frs. B. sapida (*Cupania sapida*). Akee. To 40 ft.: lvs. of 6–10 obovate-oblong lfts. to 6 in. long: fls. small, greenish-white, polygamous, in axillary racemes: fr. straw-colored to magenta-red, 3 in. long, splitting into 3 parts, with 3 shining seeds having a white fleshy edible aril at base.—Akees withstand a few degrees of frost when well established. They succeed on moist loamy soils. Propagated usually by seeds.

BLITUM: *Chenopodium capitatum.*

BLOOD-FLOWER: *Asclepias curassavica.*

BLOOD-LEAF: *Iresine.*

BLOODROOT: *Sanguinaria canadensis.*

BLOODWOOD: *Eucalyptus.* Tree: *Hæmatoxylum campechianum.*

BLOOMERIA. *Liliaceæ.* Herbs native in S. Calif., having corms, basal grass-like lvs., and yellow wheel-shaped fls. in umbels terminating the scapes.

Bloomerias withstand several degrees of frost. The plants thrive in sandy well-drained soil and sunny exposure. The corms should be dug after ripening and replanted in autumn; they are good summer bloomers, allied to Brodiæa. Propagated by seeds.

aurea: *B. crocea.*

crocea (*B. aurea*). Golden-Stars. To 1½ ft.: fls. orange-yellow striped with darker lines, ½ in. long.

BLUEBEARD: *Caryopteris.*

BLUEBELL: *Campanula rotundifolia.* California: *Phacelia Whitlavia.* Creeper, Australian: *Sollya heterophylla.* English: *Scilla nonscripta.* Spanish: *Scilla hispanica.*

BLUEBELLS: *Mertensia.*

BLUEBERRY. Certain North American Vacciniums are known as blueberry, but in horticultural practice the name is restricted mostly to *V. corybosum*, one of the highbush species. In recent years this blueberry has been greatly improved in productiveness and size of fruit; and the knowledge that it requires an acid soil has contributed to its introduction as one of the pomological products.

Common alkaline or neutral lands do not produce blueberries. An acid soil is essential, one composed of peat and sand but with good drainage and aeration. It is not necessary to plant in swamps; in fact, the plant does not thrive when the roots are permanently under water. The water-table should be at least one foot below the surface in the growing season. The permanent plantation is set about 8 feet apart each way. Surface tillage is advised. Plants begin to bear well in three or four years after setting and they should last a lifetime. They grow to a height of 6 to 8 feet. In home gardens it is advised that plants be set in ample holes or trenches about 1 foot deep in a mixture of four parts peat or half-rotted oak leaves to one part of sand; a similar mixture is used as a top-dressing in the plantation. Chemical fertilizers that leave an acid reaction in the soil may be applied, as sulfate of ammonia, acid phosphate, sulfate or muriate of potash.

Propagation of the blueberry is by dividing the clumps or rootstocks, by layering, by cuttings and by seeds, but the seeds do not reproduce the variety or strain. The home gardener, if he attempts blueberries at all, will probably purchase his plants.

BLUE-BLOSSOM: *Ceanothus thyrsiflorus.*

BLUE-BOTTLE: *Centaurea Cyanus.*

BLUE-CURLS: *Trichostema.*

BLUE-DICKS: *Brodiæa capitata.*

BLUE-EYED MARY: *Collinsia verna.*

BLUE-LIPS: *Collinsia grandiflora.*

BLUET, MOUNTAIN: *Centaurea montana.*

BLUETS: *Houstonia cærulea.*

BLUE-WEED: *Echium vulgare.*

BLUMENBACHIA (*Saloa*). *Loasaceæ.* Ann. herbs armed with stinging hairs, native of S. Amer., having opposite lobed lvs. and odd interesting fls. solitary in the axils: caps. opening at top. Propagated by seeds sown under glass and seedlings transplanted after danger of frost is over.

insignis. Ann. or grown as such, twining, the sts. to 2 ft. or more long: lvs. to 3 in. across, deeply palmately 5-lobed: fls. white, 1 in. across, hooded, with thick yellow scales spotted with red at base of petals. S. Amer.

lateritia: *Caiophora lateritia.*

BOCCONIA. *Papaveraceæ.* Trees, shrubs or per. herbs with yellowish juice, alternate mostly pinnately lobed or parted lvs. and small fls. without petals, borne in terminal branching panicles; native in Mex. and trop. Amer.; seldom planted in S. U. S.

cordata: *Macleaya cordata.*

frutescens. Shrub or tree to 25 ft.: lvs. to 16 in. long, pinnatifid: fls. purplish, the panicles 1 ft. or more long. Cent. Amer. to Peru, W. Indies.

japonica: *Macleaya cordata.*

microcarpa: *Macleaya microcarpa.*

BŒHMERIA. *Urticaceæ.* Herbs, shrubs or trees mostly native in warm countries, with alternate or opposite simple lvs. and very small unisexual fls. in clusters or spikes.

Grown under glass for the ornamental foliage or out-of-doors in the South, one species furnishing fiber. Propagated by division, or seeds when produced. Ramie is grown to some extent in southern United States; it requires fertile well-drained soil, and is easily grown. Some of the bœhmerias are weedy plants native in North America.

argentea. Lvs. alternate, to 1 ft. long and 7 in. wide, finely toothed, spotted above with silvery-gray, veined with red-brown below: fls. in branched drooping spikes to 10 in. long. Mex.

cylindrica. Per. to 3 ft.: lvs. to 3 in. long and 1½ in. wide, coarsely toothed: fls. in spikes to 1½ in. long. N. Amer., W. Indies.

macrophylla. Shrub or small tree: lvs. opposite, lanceolate, to 1 ft. long, finely toothed, usually pubescent beneath: fls. in drooping spikes to 1 ft. long. Himalayas.

nivea (*Urtica utilis*). RAMIE. CHINESE SILK-PLANT. Herb or shrub to 6 ft.: lvs. alternate, broad-ovate, to 6 in. long, coarsely toothed, white-tomentose beneath: fls. in panicles to 6 in. long. China, Japan, S. Asia.

platyphylla. Shrub to 10 ft.: lvs. opposite and alternate, broad-ovate, to 9 in. long, coarsely toothed, usually pubescent: fls. in long drooping spikes. Asia, Afr.—A variable poorly-defined species.

Urera: the plant cult. far S. under this name is probably the trop. American *Urera caracasana.*

BOGBEAN: *Menyanthes trifoliata.*

BOG PLANTS, in horticulture, differ from aquatics in the fact that they do not live permanently in deep water, but rather in wet places as about lakes and ponds and in swamps. Mostly they are native plants transferred to wet places in grounds, and sometimes colonized. For the most part they are easily grown if the natural habitat is understood and imitated. Commonly they are perennials and woody plants that take care of themselves when once established. Sedges, rushes, pickerel-weed, arrow-leaf, water plantain, spatterdock, are common bog and swamp plants, as well as some of the eupatoriums, loosestrifes and lythrum. Any region outside deserts and plains yields interesting material for the appreciative planter.

BOISDUVALIA. *Onagraceæ.* A few ann. herbs or many-stemmed little bushes, native Ore., Calif., and Pacific S. Amer., one of which may be grown in flower-garden or border in sunny situations; propagated by seeds.

densiflora (*Godetia* and *Œnothera densiflora*). Ann., erect, 1–5 ft., hairy: lvs. narrow-lanceolate, acute, denticulate: fls. light purple, small, ½ in. or less across, in close leafy axillary clusters that comprise a long interrupted terminal spike. Calif.

BOLBOXALIS: *Oxalis cernua.*

BOLDO: *Peumus Boldus.*

BOLDOA FRAGRANS: *Peumus Boldus.*

BOLLEA: *Zygopetalum.*

BOLLWILLERIA: *Sorbopyrus auricularis.*

BOLTONIA. *Compositæ.* Tall erect herbaceous aster-like perennials, glabrous: lvs. alternate and entire, usually becoming vertical by a twist at the base: heads with white, purplish or violet ray-fls. Native in U. S. and E. Asia, in moist places and on prairies.

Boltonias are often planted in the border or colonized: they are of the easiest culture. Propagated by division in the spring, also by seed. They resemble wild asters.

asteroides (*B. glastifolia*). To 8 ft.: lvs. lanceolate, to 5 in. long, sessile: heads ¾ in. across, rays white to violet and purple. Conn. to Fla. and La.

glastifolia: *B. asteroides.*

lævigata: hort. name; perhaps *B. asteroides.*

latisquama. Differs from *B. asteroides* in the larger heads 1 in. across, rays blue-violet, and in the involucral bracts. Mo. to Okla. Var. **nana** is 2–3 ft. tall with pinkish rays.

BOLUSANTHUS. *Leguminosæ.* One African tree sometimes planted in S. Calif. B. speciosus (*Lonchocarpus speciosus*). To 15 ft.: lvs. pinnate, the lfts. lanceolate: fls. papilionaceous, bright blue, in terminal often pendulous racemes: pods oblong-linear, flattened.

BOMAREA. *Amaryllidaceæ.* S. American twining herbs, with parallel-veined lvs. and tubular fls. borne in drooping umbels.

Bomareas may be grown out-of-doors in the South in partial shade or in a cool greenhouse. They require abundant water and liquid manure in the growing season. The roots may be left in the soil over winter, the tops being cut off. Propagated by division of the roots or by seeds over heat.

conferta: *B. patacocensis.*

multiflora. Lvs. oblong, to 4i n. long: fls. in dense many-fld. umbels, 1 in. long, the perianth-segms. nearly equal, outer tinged red, inner reddish-yellow spotted with brown. Colombia, Venezuela.

oligantha. Lvs. oblong, to 4 in. long: fls. to 1¼ in. long, the perianth-segms. equal, the outer red, the inner yellow spotted with reddish-brown. Peru.

patacocensis (*B. conferta*). Lvs. oblong-lanceolate, to 6 in. long: fls. bright red, the inner perianth-segms. to 2½ in. long and yellow-keeled. Andes of Ecuador and Colombia.

BOMBACACEÆ. Bombax Family. Trees of about 20 genera in the tropics, mostly American, differing in technical characters from Malvaceæ, with simple or palmately compound lvs., regular bisexual fls. having 5 sepals and petals, 5 to numerous stamens, superior 2–5-celled ovary, and dry or fleshy frs. some of which contain a woolly or cottony fiber. Only Adansonia, Bombax, Ceiba, Chorisia, Durio, and Pachira are cult. on our southern borders. The American genus Ochroma, supplying balsa wood, renowned for its lightness, belongs in this family; the species are probably not planted in the U. S.

BOMBAX. *Bombacaceæ.* Big trees with digitately compound lvs., large red fls. before the lvs., and capsular frs. woolly within and with woolly seeds; planted for ornament in the tropics and the lint in the pods sometimes used for fiber and the fleshy calyces eaten.

malabaricum. To 75 ft., spiny: lfts. 3–7, to 7 in. long: fls. to 4 in. long, clustered near ends of branches: fr. to 6 in. long. India to Malaya; planted in S. Fla.

BONAPARTEA HYSTRIX: *Agave stricta.*

BONAVIST: *Dolichos Lablab.*

BONESET: *Eupatorium.*

BONTIA. *Myoporaceæ.* One evergreen shrub or tree to 30 ft., native in W. Indies and N. S. Amer. and sometimes grown for ornament in our southernmost areas and in the tropics; much like Myoporum but fls. deeply 2-lipped. **B. daphnoides.** Lvs. oblong or lanceolate, to 4 in. long, willow-like: fls. yellow spotted with purple, ¾ in. long, 2-lipped, solitary or clustered: fr. yellow, pointed, ½ in. long.

BORAGE: *Borago.*

BORAGINACEÆ. Borage Family. Herbs, shrubs or trees, of about 85 or more genera of wide range, prevailingly with bristly hairs, having mostly alternate simple lvs. and bisexual regular fls. with 5-lobed calyx and corolla, 5 stamens, superior 2- or 4-celled ovary, and fr. commonly composed of 4 nutlets; in the herbaceous groups, the fls. are usually small but many or numerous and borne in one-sided scorpioid spikes or racemes; the colors in blue are likely to fade or change to pink; other colors abound, as yellow and orange, white, shades of red. The family furnishes medicinal plants and dyes, and also many ornamental subjects in the genera Adelocaryum, Anchusa, Arnebia, Borago, Brunnera, Cerinthe, Cordia, Cryptantha, Cynoglossum, Echium, Ehretia, Eritrichium, Euploca, Heliotropium, Lappula, Lindelofia, Lithodora, Lithospermum, Mertensia, Moltkia, Myosotidium, Myosotis, Omphalodes, Onosma, Onosmodium, Pentaglottis, Pulmonaria, Symphytum, Trachystemon.

BORAGO. Borage. *Boraginaceæ.* Hairy Medit. herbs with alternate simple lvs. and blue saucer-shaped fls. in open leafy cymes, throat filled by scales, stamens forming a cone; one or two grown in the flower-garden and *B. officinalis* sometimes as a pot-herb and for bees. Propagated by seeds sown in spring, by division or cuttings.

laxiflora. Decumbent per.: lvs. oblong or ovate: fls. pale blue, drooping, on long pedicels. Corsica.—Good for the rock-garden.

officinalis. Ann. to 2 ft.: lvs. oblong or ovate: fls. blue, purple or white. Eu., N. Afr.

orientale: *Trachystemon orientale.*

BORASSUS. *Palmaceæ.* Large heavy diœcious fan-palms of Asia and Afr., of 7 recognized species: trunk single and erect, unarmed: lvs. large and stiff, the petiole somewhat spiny-dentate on margins: infl. among the lvs.; staminate infl. long and much branched, the fls. under closely imbricated bracts in dense spikes 1 in. diam. and about 1 ft. long, the stamens 6; pistillate infl. smaller and little branched, the fls. fewer: fr. a large drupe-like body with 1–3 seeds, subtended by enlarged perianth-parts.

flabellifer. Palmyra Palm. To 100 ft. and trunk to 3 ft. diam., old lvs. hanging on young trees: lvs. to 10 ft. across, many-cleft, rigid: fr. 6–8 in. diam., depressed-globular, with fibrous pulp. India and Malaya.—Much planted in S. Asia for its many uses and products; intro. in S. Fla.

BORDER. A narrow planting along a boundary or division line (as a walk or road) or against a building or wall is known as a border, although the term is sometimes inaccurately employed for any long narrow or strip planting even though it has no relation to margins or confines. Ordinarily it is 5 feet or less broad so that it can be planted and tended from one side, but it may be broader if there is easy access from either side. A border is properly not only a place in which plants can be conveniently grown, but it has relation to the lay-out and subdivision of the home property. A good border, well placed for the growing of plants, provides an attractive receiving plot for accessions, and should afford a never-ending variety in bloom and vegetation.

The border receives different designations, depending on the kinds of plants; it may be a shrub border, a flower border, a hardy border for native and other hardy plants, a vine border. As a rule, the most effective planting is that which is thrown into masses, for one plant reinforces the other, and the flowers have a good setting or background. Very striking displays of foliage and flowers and plant forms can be made when massed. Plants are more easily grown when planted in a border, since the whole area can be kept cultivated with ease; and if a plant becomes weak or dies, its place is readily filled by the neighboring plants spreading into it. The border may be mixed, — that is, composed of a great variety of plants, — or it may be made up of one species in considerable quantity. In long and very striking borders, it is often best to have the background — that is, the back row — of one general type of plant in order to give continuity and strength to the whole group. In front of this a variety of plants may be set. Shrub borders are sometimes planted of one species only, for continuous or artistic effect.

For best results in border planting the land should be fertile. The whole area should be plowed or spaded. If the border is composed of shrubs, and is large, a horse cultivator may be run in and out between the plants for the first two or three years, since the shrubs will be set 2 to 4 feet apart. Ordinarily, however, the tillage is by hand tools. After the plants are once established and the border is filled, it is best to dig up as little as possible, for the digging disturbs the roots and breaks off the crowns. It is usually best to pull out the weeds and give the border a top-dressing each autumn of well-rotted manure. If the ground is not very rich, an application of ashes or some commercial fertilizer may be given from time to time. The border may be planted thick to allow the plants to run together, thereby giving one continuous effect. Most shrubs should be set 3 feet apart. Those as large as lilacs may go 4 feet and sometimes even more. Common herbaceous perennials, as bleeding-heart, delphiniums, hollyhock, and the like, should go 12 to 18 inches. On the front edge of the border is an excellent place for annual and tender flowering plants. These herbaceous plants may be planted far enough apart to allow of full development. Spring- and summer-flowering bulbs may find good conditions in a well-made border. Into the heavy borders about the boundaries of the place the autumn leaves will drift and afford an excellent mulch. If these borders are planted with shrubs, the leaves may be left there to decay, and not all be raked off in the spring.

BORECOLE: *Kale.*

BORONIA. *Rutaceæ.* Australian shrubs or subshrubs with simple or compound lvs., attractive fragrant purple, red or white fls., 4-parted ovary and 4 styles, and fr. of 2–4 carpels.

Grown in a cool greenhouse in well-drained soil and out-of-doors in California. Plants should be cut back after flowering to make bushy specimens, and should be replaced by new plants after two years. Propagated by seeds and cuttings of half-ripened wood.

alata. Mostly glabrous shrub, somewhat glaucous: lvs. of 7–11 obovate or oblong obtuse lfts., entire or crenate, to ½ in. long: fls. in terminal clusters, pink, fragrant, with very sharp petals, opening wide.

elatior. To 4 ft.: lvs. of 5–13 linear lfts.: fls. rose-red or purplish, nodding, about ¼ in. long, not wide-opening.

heterophylla. Glabrous tall shrub to 6 ft.: lvs. sometimes simple and linear, to 2 in. long, sometimes with 3 or 5 linear lfts.: fls. pink or scarlet, drooping, solitary on axillary whorled peduncles, to ½ in. diam., not opening widely.

megastigma. To 2 ft.: lvs. of 3–5 linear lfts.: fls. purple, yellow inside, rather open.

spathulata. Glabrous and glaucous undershrub: lvs. simple, spatulate to obovate or lanceolate, but broad-ovate on young branches, mostly obtuse, to about 1 in. long: fls. small, pink, in little terminal clusters.

viminea. Glabrous small shrub: lvs. simple, linear-lanceolate, to 1 in. long: fls. solitary, axillary and terminal, the petals to ¼ in. long.

BOSCIA UNDULATA: *Vepris lanceolata.*

BOSEA. *Amaranthaceæ.* Upright shrubs with alternate entire lvs., small fls. in terminal spikes or racemes, and ornamental crimson berries; native in Canary Isls., Cyprus and Himalayas. Hardy only in S. U. S. Propagated by seeds and cuttings.

Amherstiana (*Deeringia Amherstiana*). Lvs. ovate, to 7 in. long: fls. greenish, in terminal panicles: berries ⅙ in. across. Himalayas. Var. **variegata** is listed.

BOSSEKIA: *Rubus deliciosus.*

BOSSIÆA. *Leguminosæ.* Australian shrubs with simple mostly entire lvs., yellow, orange or red papilionaceous fls. solitary or in clusters, and flat pods; intro. in S. Calif.

Aquifolium. Lvs. opposite, broad-cordate, to ¾ in. across, prickly-toothed: fls. yellow, about ½ in. long, solitary.

biloba. To 1½ ft.: lvs. alternate, linear or broader, to 2 in. long, retuse or 2-lobed, margins revolute: fls. to ¾ in. long.

ornata. To 2 ft.: lvs. alternate, ovate to lanceolate, to 2 in. long: fls. to ¾ in. across, in clusters.

BOTANIC GARDEN. An institution for the maintenance of a growing collection of plants under scientific management and control for purposes of education and research, together with such libraries, herbaria, laboratories and museums as are essential to its particular undertakings. Each botanic garden naturally develops its own special field, depending on the personnel, location, extent, available funds, as well as on the terms of its charter. It may include greenhouses, test grounds, herbary, arboretum and other departments. It maintains a scientific as well as a plant-growing staff, and publication is one of its major modes of expression.

The botanic garden may be an independent institution, or it may be connected or affiliated with a college or university. If a department of an educational institution it may have close relation with the teaching program; but in any case it exists for scientific ends and is not to be restricted or diverted by other demands. It is not a landscape or ornamental garden although it may be artistic, nor an experiment station, nor yet a park with labels on the plants. The essential element is the intention of the enterprise, which is the acquisition and dissemination of botanical knowledge.

BOTHRIOCLINE: *Erlangea tomentosa.*

BO-TREE: *Ficus religiosa.*

BOTRYCHIUM. Grape-Fern. Moonwort. *Ophioglossaceæ.* Mostly somewhat fleshy ferns with short underground sts. each of which sends up a single petiole bearing a 1–3-pinnate lf. and an erect panicle of sessile sporanges arranged like grapes; native chiefly of temp. regions of both hemispheres, many in the U. S.; the species are confused, and they do not commonly appeal to the cultivator. See *Ferns.*

dissectum. Hardy, to 1½ ft.: lvs. to 6 in. across, ternately compound into finely dissected segms., evergreen. Me. to Va. and Ky. Var. **obliquum** (*B. obliquum, B. ternatum* var. *obliquum*) has lvs. ternately divided into toothed segms. to 1 in. long.

Lunaria. Hardy: lvs. solitary, clasping, to 1 ft. long, pinnate into lunate entire or toothed segms. N. N. Amer., Eu., Asia.

matricariæfolium (*B. ramosum*). Hardy: lvs. to 1 ft. long, sessile, 1–2-pinnate, segms. toothed or divided. N. Amer., Eu.

obliquum: *B. dissectum* var.

ramosum: *B. matricariæfolium.*

ternatum: the plant cult. under this name is *B. dissectum* var. *obliquum.*

virginianum. Rattlesnake-Fern. Hardy: lvs. to 2½ ft. long, broadly triangular, ternate, the segms. pinnate and much cut. N. Amer., Eu., Asia.

BOTTLE-BRUSH: *Callistemon, Melaleuca.*

BOTTLE-TREE: *Brachychiton.*

BOUGAINVILLEA: *Buginvillæa.*

BOUNCING BET: *Saponaria officinalis.*

BOUSSINGAULTIA. *Basellaceæ.* Trop. American per. vines with alternate fleshy lvs. and small fls. in spike-like racemes.

Grown for ornament out-of-doors in warm regions and under glass in cold regions; also root-hardy North. Propagated by seeds, division of roots and by tubercles produced in leaf-axils.

baselloides. Madeira-Vine. Mignonnette-Vine. Tall vigorous twiner: lvs. ovate, to 3 in. long: fls. white, fragrant, the racemes sometimes 1 ft. long, in late summer or autumn.

BOUVARDIA. *Rubiaceæ.* Mostly shrubs native in Mex. and Cent. Amer., with opposite or whorled lvs., tubular 4-lobed red, yellow or white fls. in terminal cymes, sometimes solitary, and capsular fr.

Bouvardias are grown in the greenhouse and were once very popular. Many of the old florists kinds are supposed to be hybrids. They thrive in a temperature of about 55° in rich soil with abundant water. Propagated by root-cuttings and cuttings of fresh shoots taken with a heel and placed over bottom heat.

Humboldti. Lvs. opposite, ovate: fls. white, fragrant, to 2½ in. long and 1¼ in. across. Hort. form.

leiantha. Lvs. in whorls of 3–5, ovate, to 3 in. long, pubescent beneath: fls. deep red, ½ in. long, glabrous outside. Mex. to Costa Rica.

longiflora. To 5 ft.: lvs. opposite, ovate or lanceolate, to 2 in. long: fls. white, to 3½ in. long, glabrous outside, solitary. Mex.

ternifolia (*B. triphylla*). To 6 ft.: lvs. in 3's and 4's, lanceolate to ovate: fls. red, to 1¼ in. long, pubescent outside. Mex., W. Tex.

triphylla: *B. ternifolia.*

BOWER-PLANT: *Pandorea jasminoides.*

BOWIEA: *Schizobasopsis.*

BOWKERIA. *Scrophulariaceæ.* S. African shrubs or trees with lvs. usually in 3's and 2-lipped fls.; may be grown in S. Calif.

Gerrardiana. Shrub to 10 ft.: lvs. oval-lanceolate, to 6 in. long, finely toothed, paler beneath: fls. white, upper lip to ½ in. long and ⅔ in. broad.

triphylla. Very similar to the above but differing in the narrow upper lip of corolla.

BOX: *Buxus, Eucalyptus.* **Brisbane:** *Tristania conferta.* **-Elder:** *Acer Negundo.* **-Thorn:** *Lycium.* **Victorian:** *Pittosporum undulatum.*

BOYKINIA (*Therofon*). *Saxifragaceæ.* Per. American herbs with creeping rootstocks, alternate broad lvs. and white fls. in cymes or panicles; useful in the wild- or rock-garden; native mostly in woods and mts.

elata (*B. occidentalis*). To 2 ft.: lvs. 1–4 in. across, deeply lobed and toothed: petals much longer than calyx-lobes. Calif.

major. To 3 ft.: lvs. 4–8 in. across, cut and toothed: petals slightly longer than calyx-lobes. Ore., Calif.

occidentalis: *B. elata.*

rotundifolia. To 2 ft.: lvs. 2–7 in. across, shallowly lobed and toothed: petals only slighty longer than calyx-lobes. Calif.

tellimoides (*Saxifraga tellimoides*). To 3 ft.: lvs. to 5 in. across, 7–9-lobed: fls. greenish, petals twice or more longer than calyx-lobes. Japan.

BRACHYCHITON. Bottle-Tree. *Sterculiaceæ.* Australian trees sometimes with swollen trunk, bearing alternate entire or palmately lobed lvs., unisexual or polygamous fls. without petals but the calyx mostly corolla-like and bell-shaped, commonly in axillary panicles, and fr. a woody follicle, tardily dehiscing; planted for ornament in southern regions, and particularly in Calif. Propagated by seeds and cuttings of ripened wood.

acerifolium (*Sterculia acerifolia*). Flame-Tree. To 60 ft.: lvs. deeply 5–7-lobed, to 10 in. across, shining: fls. bright scarlet: fr. black, to 4 in. long.

Bidwilli (*Sterculia Bidwilli*). Shrub or tree, tomentose: lvs. deeply 3-lobed: fls. red.

discolor (*Sterculia discolor*). Lvs. irregularly 5–7-lobed or angled, white-tomentose beneath, to 6 in. across: fls. livid: fr. to 6 in. long, densely rusty-tomentose.

luridum (*Sterculia lurida*). Lvs. palmately 5–7-lobed, pubescent on both sides: fls. livid and variegated: fr. to 6 in. long. tomentose.

populneum (*Sterculia diversifolia*). Kurrajong. To 60 ft.: lvs. ovate and entire or 3-5-lobed, to 3 in. long, shining: fls. yellowish-white, reddish inside: fr. to 3 in. long. Var. **occidentalis** (*Sterculia Gregorii*) has deeply 3-lobed lvs. and salmon-pink fls.

rupestris (*Sterculia rupestris*). Tree with swelling trunk often contracted at top and bottom: lvs. oblong-linear, entire, to 6 in. long, or digitately compound into 5–9 linear-lanceolate lfts.: fls. tomentose: fr. 1 in. long.

BRACHYCOME. *Compositæ.* Herbaceous annuals and perennials with simple or branching sts., basal or alternate lvs., entire or more or less pinnately cut: heads solitary or loosely clustered at ends of branches; ray-fls. white, blue or lilac; pappus of bristles or scales or lacking. Of easy cult. in the flower-garden. Propagated by seeds.

iberidifolia. Swan River Daisy. Ann., branching, to 1½ ft.: lvs. alternate, pinnate into narrow segms.: heads 1 in. across, blue, rose or white. Australia.—A good edging and border ann.

BRACHYGLOTTIS. *Compositæ.* New Zealand shrubs or small trees with large lobed lvs. and small heads borne in terminal branched panicles, with ray- and disk-fls.; pappus bristly. Grown out-of-doors in S. Calif.

Rangiora. To 14 ft.: lvs. to 15 in. long, sinuate, white-tomentose beneath, glossy above: heads ⅛ in. long, involucral bracts purplish.

repanda. To 20 ft.: lvs. to 1 ft. long, sinuate, white-tomentose beneath, dull above: heads ⅙ in. long, involucral bracts white, shining. Var. **variegata** is listed.

BRACHYPODIUM. *Gramineæ.* Slender ann. or per. grasses mostly of the north temp. zone, having many-fld. flattened spikelets borne in spike-like racemes; a few sometimes grown for ornament. See *Grasses.*

distachyon. Ann. to 1½ ft.: lvs. to 4 in. long and ⅙ in. wide, slightly hairy: racemes to 3 in. long, awns to ¾ in. long. Medit. region, S. Afr.

gracile: *B. sylvaticum.*

sylvaticum (*B. gracile*). Per. to 4 ft.: lvs. to ⅔ in. across, flaccid, hairy: racemes nodding, to 6 in. long, awns to ⅓ in. long. Medit. region, Asia.

BRACHYSEMA. *Leguminosæ.* Australian shrubs with simple lvs., mostly red papilionaceous fls. solitary or clustered, and swollen pods; cult. out-of-doors in S. Calif.

acuminatum. Subshrub, often spreading: lvs. opposite, oval-elliptic, silvery-canescent beneath.

lanceolatum. To 3 ft.: lvs. usually opposite, lanceolate, to 4 in. long, silvery-canescent beneath: pods about ½ in. long.

BRACKEN: *Pteridium.*

BRACT: a much-reduced leaf, particularly the small or scale-like leaves in a flower-cluster or associated with the flowers and on the upper part of flowering stems.

BRACTEOLARIA: *Baphia.*

BRACTLET: bract borne on a secondary axis, as on the pedicel or even on a petiole.

BRADBURYA: *Centrosema.*

BRAHEA. *Palmaceæ.* As now understood Brahea has 3 species in Mex. and 1 in El Salvador: they are hermaphrodite fan-palms of middle size, unarmed except perhaps on petioles, with solitary trunk bearing remains of old lf.-bases above, more or less ringed below, spadices among the lvs. and commonly exceeding them, diffusely short-branched, the branches not subtended by spathes; fls. sessile on the tomentose or pubescent branchlets; stamens 6, filaments united in tube: fr. oblong-elliptic, ½ in. or less long. The Braheas are more or less planted in S. Calif. For cult. see *Palm.*

armata: *Erythea armata.*

calcarea. Trunk bearing old lvs. or becoming naked, to 20 ft.: lvs. to 3 ft. and more across making a heavy rather dense crown, shining green above and glaucescent underneath, divided to about the middle into some 80 narrow eventually drooping very long- and narrow-pointed deeply bifid segms., filaments few; petiole unarmed, slender, about equalling or exceeding the blade: branchlets of spadix filiform and pubescent, the fls. solitary: fr. ovoid, about ½ in. long; seed adherent to the endocarp. Mex., near Veracruz.

dulcis. Trunk stout, to 20 ft., bearing scars of old lvs. or at top covered with old lvs., naked at base: lvs. 4–5 ft. lengthwise, green, divided to middle or beyond into about 60 rather broad long-pointed and deeply bifid long-hanging segms., the filaments few; petiole rather slender, coarsely retrorse-spiny: spadix to 5 or 7 ft. long, pendulous; fls. partly immersed, the branchlets terete and thick and densely tomentose: fr. oblong-ellipsoid, about ½ in. long, yellow and succulent; seed free from endocarp. Mex.

edulis: *Erythea edulis.*

filamentosa, filifera: *Washingtonia filifera.*

glauca: *Erythea armata.*

Pimo. Trunk 10–12 ft.: lvs. 2 ft. or so long, dull green but paler underneath and scurfy on ribs, divided less than half the depth into 40–50 rather firm shortly bifid segms., filaments few; petiole very slender, scurfy, with many small deflexed spine-teeth: spadix about 1½ ft. long, the branchlets filiform and somewhat tomentose; fls. glomerate. Mex.—Insufficiently known.

BRAKE: *Pteridium, Pteris.* **Cliff-:** *Pellæa.* **Rock-:** *Cryptogramma.*

BRAMBLES: *Rubus.*

BRASENIA. *Nymphæaceæ* (or *Cabombacaceæ*). One aquatic herb, often in deep water, native in N. Amer., Asia, Afr. and Australia, grown sometimes in ponds. Propagated by seed or division of roots. **B. Schreberi** (*B. peltata. B. purpurea*). WATER-SHIELD. Lvs. floating, to 4 in. long and 2 in. wide, peltate, submerged parts coated with thick transparent jelly: fls. purple, ½ in. across, on long axillary peduncles: fr. ⅓ in. long, of separate carpels.

BRASSAVOLA. *Orchidaceæ.* Trop. American epiphytes having pseudobulbs, fleshy lvs. and fls. solitary or in short racemes, the sepals and petals small and spreading, the lip entire and attached to column at base. For cult. see *Orchids.*

cucullata. Pseudobulbs 6 in. high, bearing a lf. to 8 in. long: fls. usually solitary, the sepals and petals white with rosy tips, the lip white toothed on edges, with long point, Oct.–Dec. W. Indies, Venezuela, Guatemala.

Digbyana (*Lælia Digbyana*). Pseudobulbs 6 in. high, bearing a lf. to 8 in. long: fls. solitary, fragrant, to 5 in. across, greenish-white, the lip deeply fringed on margins, May–Aug. Honduras, Mex.

glauca (*Lælia glauca*). Similar to the above but with fls. bright olive- or whitish-green and shortly fringed lip, Feb.–Mar. Mex., Guatemala.

BRASSIA. *Orchidaceæ.* Epiphytes native in trop. Amer., having pseudobulbs bearing 1 or 2 lvs. and fls. in racemes, the sepals and petals narrow and long-pointed, often tail-like, the lip entire and shorter than the sepals; grown in an intermediate temperature. See *Orchids.*

brachiata. Pseudobulbs to 5 in. high, bearing 2 linear-lanceolate lvs. to 1 ft. long: scapes to 3 ft. long, bearing a 7–10-fld. raceme; sepals about 8 in. long, yellowish-white marked with brown below, the petals about half as long; lip light yellow marked with green, July–Oct. Guatemala.

Lawrenceana. Pseudobulbs about 5 in. long, bearing 2 lanceolate lvs. to 1 ft. long: scapes to 2 ft. long; sepals and petals bright yellow spotted with brown, the former about 3 in. long, the lip bright yellow, May–June. Brazil.

longissima (*B. Lawrenceana* var. *longissima*). Pseudobulbs to 3 in. high, bearing 1 or 2 lvs. to 1 ft. long and 2 in. wide: scapes to 2 ft. long, with a 10–15-fld. raceme; sepals and petals golden-yellow spotted with brown at base, the lateral sepals to 10 in. long; lip white spotted with red-brown, June. Costa Rica.

verrucosa. Pseudobulbs to 4 in. long, bearing 2 linear lvs. to 1 ft. long: scapes to 2½ ft. long, with 6–13-fld. racemes; sepals and petals green spotted at base with brown, the former to 4 in. long; lip white spotted with dark green below, Apr.–June. Mex., Guatemala.

BRASSICA (incl. *Sinapis*). COLES. MUSTARDS. *Cruciferæ.* Mostly ann. and bien. herbs, sometimes per., yielding many edible plants: see *Broccoli, Brussels Sprouts, Cabbage, Cauliflower, Collards, Kale* (Borecole), *Kohlrabi, Mustard, Pe-tsai, Rape, Rutabaga, Turnip.* The species are probably 50 or more, original in the Old World, but the nativity of many of them is unknown; some of them are widespread weeds. They are erect tall branched and for the most part glabrous often glaucous plants with variously pinnatifid or lyrate or strongly toothed lower lvs., yellow or yellowish-white or sometimes white fls. in terminal racemes in spring and summer, pods or siliques elongated. The cult. is simple; they are essentially cool-season subjects.

acephala: *B. oleracea* var.

alba (*Sinapis alba*). WHITE MUSTARD. Ann. to 4 ft., sparsely hairy: lvs. oval to obovate, deeply divided on sides: fls. yellow, about ½ in. long: pod to 1½ in. long, spreading, lower part seed-bearing and nodulose, beak flat.

alboglabra. Ann., perhaps sometimes living over winter, glabrous and very glaucous, to 3 ft.: lvs. thick, lower ones oval, sinuate, to 10 in. long, auricled or lobed at base of blade, long-stalked, upper st.-lvs. long-oblong and petioled or not clasping: fls. white, large, cabbage-like: pod 2–3 in. long. Probably from Orient, there grown as pot-herb.

arvensis (*Sinapis arvensis*). CHARLOCK. Widespread weed in grain fields and waste places, the seed perhaps sometimes employed in the making of table mustard: ann. to 3 ft. or more, green, commonly hispid toward base and sometimes above: lvs. ovate to oblong-ovate, variously lobed or lyrate, not clasping: fls. small, yellow: pod about ¾ in. or less long, nodulose, beak often ½ in. or more long.

botrytis: *B. oleracea* var.

bullata: form of *B. oleracea* var. *capitata*.

campestris. Ann., in grain fields eastward and a great weed on Pacific Coast, glaucous all over, 2–6 ft.: lvs. clasping, the lower ones variously lyrate-lobed: fls. small, bright yellow: pod 2–3 in. long.

capitata: *B. oleracea* var.

cauliflora: *B. oleracea* var. *botrytis*.

caulorapa. KOHLRABI. Low bien., glabrous and glaucous: st. swelling just above ground into the "turnip" or edible part: lvs. rather small, 10 in. or less long, with oval dentate blade and long petiole: fls. cream-yellow: pod 2–3 in. long, with short thick beak.

chinensis. PAK-CHOI. Ann. or bien., glabrous, somewhat glaucous at maturity: lower lvs. shining green making a rather compact crown or cluster to 20 in. high but not a head, obovate and entire or nearly so, the petiole white and narrowly winged or margined but not jagged; st.-lvs. clasping: fls. pale yellow, ¾ in. long: pod to 2½ in. long. Grown as pot-herb.

gemmifera: *B. oleracea* var.

japonica: *B. juncea* var. *crispifolia*.

juncea (*Sinapis juncea. B. rugosa*). LEAF-MUSTARD. Ann., green but st. sometimes slightly glaucous, to 4 ft.: lower lvs. oval to obovate, rather thin, lyrate-lobed or divided, with toothed or scalloped edges; st.-lvs. narrowed at base but not clasping: fls. bright yellow: pod to 1½ in. long. The commonest form of leaf-mustard for greens, often in the var. **crispifolia** (*B. japonica* of hort. but not botanically) known as Southern Curled. Sometimes run wild.

Napobrassica. RUTABAGA. Bien., very glaucous and thick-lvd., glabrous, the underground tuber with solid yellow or white flesh and with long neck or crown and often withstanding winter in the N.: lvs. large and long, lyrate-pinnatifid, those on st. with clasping base: fls. light yellow to whitish-yellow: pods much spreading on stout pedicels, the beak stout and short. Var. **solidifolia** has long not-lobed radical lvs.

Napus. RAPE. COLZA. Ann., but late-sown plants pass the winter and bloom following spring, making thin tap-root: otherwise much like *B. Napobrassica* except that the pods are ascending on rather thin pedicels and the beak is slender and commonly ½ in. or more long.

narinosa. Stout low glabrous not glaucous bien., bearing short clusters of orbicular-ovate small puckered mostly entire lower lvs. with broad whitened petioles; st.-lvs. very broad and clasping, entire: fls. yellow: pod very thick and relatively short, ¾ in. or less long and one-half or one-third as broad, the beak very short and stout. Grown for pot-herb by Chinese.

nigra (*Sinapis nigra*). BLACK MUSTARD. Tall ann. to 6 ft. and more, mostly hispid-hairy at least below, little it at all glaucous: lvs. pinnatifid or lobed, terminal part large, petioled, dentate: fls. yellow, in many short racemes: pods 1 in. or less long, 4-sided, appressed to rachis. A widespread weed, and as a cult. plant the main source of table mustard.

oleracea. Thick-lvd. glaucous per. (probably also bien.) on coasts of W. England, represented in cult. by many races: lower lvs. to 20 in. long, oblong or obovate, lobed at base; st.-lvs. narrow, long, sometimes clasping: fls. whitish-yellow or cream-yellow, large, to 1 in. long: pods to 4 in. long, spreading. Not in cult. except now and then in test grounds. Var. **acephala** (*B. acephala*) comprises forms without heads or dense rosettes: KALE or BORECOLE, COW-CABBAGE. Var. **botrytis** (*B. botrytis*) has whitish heads formed of thickened transformed fl.-clusters: CAULIFLOWER, BROCCOLI. Var. **capitata** (*B. capitata*) has one dense head of consolidated lvs.: CABBAGE (one form being Savoy, sometimes known as var. *bullata* or *B. bullata*). Var. **gemmifera** (*B. gemmifera*) has small compact buds or heads in lf.-axils long the st.: BRUSSELS SPROUTS, known commonly as "SPROUTS." Var. **italica** with thickened fl.-branches not condensed into a solid head: SPROUTING, BRANCHING or ASPARAGUS BROCCOLI. VAR. **Tronchuda**; a low cabbage-like plant without head and with broad midribs: PORTUGUESE CABBAGE or KALE.

parachinensis. FALSE PAK-CHOI. Like *B. chinensis* but with radical lvs. more orbicular and petiole not margined, st.-lvs. narrowed to base and not clasping. Grown by Chinese as pot-herb.

pekinensis (*B. Pe-Tsai*). PE-TSAI (which see). CELERY CABBAGE. Ann. with green soft foliage, glabrous or essentially so: basal lvs. large and very broad, with undulate or obscurely toothed margins, the petiole broad, flat and with jagged wings; st.-lvs. either stalked or clasping: fls. light yellow: pod to 2½ in. long. Grown as a cool-season vegetable, the lvs. forming a more or less solid attractive head.

Pe-Tsai: *B. pekinensis*.

Rapa. TURNIP. Green-lvd bien., with white- or yellow-fleshed flat or globular tuber not bearing a long neck or crown and that does not withstand the winter in the N.: lvs. soft but hispid, to 20 in. long lyrate-pinnatifid; st.-lvs. clasping: fls. yellow: pods 2½ in. long or less. Var. **lorifolia**, STRAP-LEAVED T., has radical lvs. nearly or quite unlobed. Var. **septiceps.** SEVEN-TOP T. A race with thick not tuberous root that passes the winter and sends up several shoots that are used for food. Sometimes sold as "Italian kale."

rugosa: *B. juncea*.

BRASSOCATTLÆLIA. *Orchidaceæ.* Trigeneric hybrids between the genera Brassavola, Lælia and Cattleya.

Mackayi (*B. Digbyana* × *L.-C. elegans*).

BRASSOCATTLEYA. *Orchidaceæ.* A group comprising hybrids between the genera Brassavola and Cattleya.

Fournieræ (*B. Digbyana* × *C. labiata*).
heatonensis (*B. Digbyana* × *C. Hardyana*).
Holfordii (*B. Digbyana* × *C. Forbesii*).
Hyeæ (*B. Digbyana* × *C. Harrisoniana*).
langleyensis (*B. Digbyana* × *C. Schroederiana*).
Leemanniæ (*B. Digbyana* × *C. Dowiana*).
Mariæ (*B. Digbyana* × *C. Warneri*).
Maronæ (*B. Digbyana* × *C. Warscewczii*).
Maroni (*B. Digbyana* × *C. Mendelii*).
Sedeni (*B. Digbyana* × *C. Trianæi*).
Thorntonii (*B. Digbyana* × *C. Gaskelliana*).
Veitchii (*B. Digbyana* × *C. Mossiæ*).

BRASSOLÆLIA. *Orchidaceæ.* A series of hybrids between Brassavola and Lælia.

Gratrixiæ (*B. Digbyana* × *L. cinnabarina*).
Jessopi (*B. Digbyana* × *L. xanthina*).
Veitchii (*B. Digbyana* × *L. purpurata*).

BRAUNERIA: *Echinacea*.

BRAZIL-NUT: *Bertholletia.*

BRAZIL-WOOD: *Cæsalpinia echinata.*

BREADFRUIT. The great rough syncarp of *Artocarpus communis*, native probably in the Malayan Archipelago and now widely dispersed in the torrid zone; it is cooked for eating. The tree is large and heavy-leaved. The fruit is borne on small branches; it is commonly 4–8 inches in diameter when full grown, spherical or short-oblong. The tree is sometimes seen in economic collections under glass and may be set out in the open in the warmest parts of the continental United States, but its real culture is confined to low moist regions in the tropics. The usual breadfruit is seedless and is propagated by means of suckers and root-cuttings. The seed-bearing form, usually called breadnut, may be raised from seeds; this is grown for the seeds which are roasted or boiled.

BREADNUT: *Brosimum Alicastrum;* see *Breadfruit.*

BREADROOT, INDIAN: *Psoralea esculenta.*

BREVOORTIA. *Liliaceæ.* One California cormous herb, grown in shady well-drained locations. **B. Ida-Maia** (*Brodiæa coccinea*). Floral Fire-Cracker. To 3 ft.: lvs. basal, linear: fls. tubular, scarlet tipped with green, 1½ in. long, nodding in umbels terminating the scape.

BREYNIA. *Euphorbiaceæ.* Shrubs or trees with alternate simple lvs., monœcious apetalous fls. usually solitary in the axils, and fr. a berry; native in Old World tropics. Grown for ornament and hedges in the warmest parts of the country and in greenhouses in the N. Propagated by cuttings of green wood and roots.

nivosa (*Phyllanthus nivosus*). Snow-Bush. Loose-growing shrub, 3–4 ft.: lvs. oval, to 2 in. long, mottled or speckled green and white: fls. small and greenish. S. Sea Isls.; more or less run wild in Fla. and tropics. Var. **atropurpurea** (var. *purpurea*) has dark purple lvs. and var. **roseo-picta** has lvs. mottled with pink and red.

BRICKELLIA (*Coleosanthus*). *Compositæ.* American herbs or shrubs with alternate or opposite lvs. and heads in panicles or cymes, of white, yellowish or pink disk-fls.; pappus bristly; achenes 10-ribbed. One species is grown in the border where it thrives in moist shady locations. Propagated by cuttings over heat.

grandiflora. Tassel-Flower. Per. to 3 ft.: lvs. triangular-ovate, to 4 in. long, toothed: heads about ½ in. across, yellowish-white. W. N. Amer., in mts.

BRIDAL WREATH: *Spiræa prunifolia* and *trichocarpa;* see also *Francoa ramosa.*

BRIDGESIA: *Ercilla spicata.*

BRISTLY: bearing stiff strong hairs or bristles.

BRITTONASTRUM. *Labiatæ.* Per. herbs native in Ariz. and Mex., with toothed opposite lvs. and white, red or purple 2-lipped fls. in whorls in terminal spikes, stamens exserted; sometimes grown in the herb-garden but not hardy in the N. Propagated by division.

canum (*Cedronella* and *Agastache cana*). To 3 ft., woody, hoary: lvs. ovate, to 1½ in. long: fls. pink, 1 in. long.

mexicanum (*Cedronella mexicana. Gardoquia betonicoides*, but the plant sold under this name may not be correct). To 3 ft., with creeping roots: lvs. ovate-lanceolate, to 2½ in. long: fls. pink, 1 in. long.

BRIZA. Quaking-Grass. *Gramineæ.* Small ann. and per. grasses having many-fld. flattened nodding spikelets borne in panicles with hair-like branchlets; native in Old World and S. Amer., a few grown for ornament.

compacta: hort. name.

geniculata: *Eragrostis obtusa.*

gracilis: *B. minor.*

maxima. Ann. to 2 ft.: lvs. to 6 in. long and ¼ in. wide: spikelets ovate, ½ in. or more long, often bronzy, in panicles to 3 in. long, decorative. Medit. region.

media. Per. to 2 ft.: lvs. to 3 in. long and ⅙ in. wide: spikelets ovate, to ¼ in. long, often purplish, in panicles to 10 in. long. Eu., Asia; nat. in N. Amer.

minor (*B. gracilis*). Ann. to 1½ ft.: lvs. to 5 in. long and ⅓ in. wide: spikelets triangular, to ⅙ in. long, in panicles to 5 in. long. Eu.; nat. in N. Amer.

BRIZOPYRUM: *Demazeria sicula.*

BROCCOLI (*Brassica oleracea* var. *botrytis*). A form or race of the cauliflower tribe, requiring a long season and usually coming to best results (where the climate allows) if the plants are allowed to stand over winter and to make their heads in spring, which will be one year from seed-sowing. The leafage of the plant is likely to be more erect than in the cauliflower and the leaves narrow and long. A related plant, not making a large single white head but a loose more or less leafy panicle of edible flower shoots, is the asparagus or sprouting broccoli (*B. oleracea* var. *italica*). For culture of broccoli, see *Cauliflower.*

BRODIÆA. *Liliaceæ.* Cormous herbs mostly native in W. N. Amer., in fields and on hills and mountains, with few basal grass-like lvs. and funnel-shaped or campanulate fls. in loose umbels terminating the slender scapes.

Brodiæas are hardy in the Pacific and southern states and useful in borders; also sometimes grown in pots; spring and summer bloomers. They thrive on any soil that is not wet or heavily manured. Propagated by seeds or offsets if produced.

Bridgesii. To 9 in.: fls. pale lilac, about 1½ in. long, fertile stamens 6. Calif., Ore.

californica. To 1 ft.: fls. violet-purple, to 1½ in. long, fertile stamens 3. Calif.

candida. Similar to *B. laxa* but with white or pale blue fls. Calif.

capitata (*Dichelostemma capitatum*). Blue-Dicks. To 2 ft.: fls. blue, ⅔ in. long, in head-like umbels, fertile stamens 6. S. Ore. to Lower Calif.

coccinea: *Brevoortia Ida-Maia.*

congesta: *B. pulchella.*

coronaria (*B. grandiflora*). To 1½ ft.: fls. violet-purple, to 1¾ in. long, fertile stamens 3. B. C. to Calif.

crocea. To 1 ft.: fls. bright yellow, ¾ in. long, fertile stamens 6. Calif.

Douglasii (*Triteleia grandiflora*). To 2 ft.: fls. blue, to 1 in. long. B. C. to Ore. and Mont.

grandiflora: *B. coronaria.*

Hendersonii. Similar to *B. Bridgesii* but with yellow fls. having purple band down center. Ore.

ixioides (*Calliprora ixioides*). Pretty Face. To 1½ ft.: fls. salmon-yellow veined with dark purple, ¾ in. long, fertile stamens 6. Ore to S. Calif. Var. **splendens** has large bright yellow fls.

lactea (*Hesperoscordum hyacinthinum*). Wild-Hyacinth. To 1½ ft.: fls. white or lilac, ½ in. long, fertile stamens 6. B. C. to Calif.

laxa (*Triteleia laxa*). Grass-Nut. Triplet-Lily. To 2 ft.: fls. purple or rarely white, to 1¾ in. long, fertile stamens 6. Calif.

minor (*B. Purdyi. Hookera minor*). To 10 in.: fls. violet-purple, 1 in. long, fertile stamens 3. Calif.

multiflora. To 2 ft.: fls. light purple, ¾ in. long, in head-like umbels, fertile stamens 3. Calif., Ore.

peduncularis (*Triteleia peduncularis*) To 3 ft.: fls. violet-purple or white, ¾ in. long, fertile stamens 6. Calif.

pulchella (*B. congesta. Dichelostemma pulchellum*). To 3 ft.: fls. violet-purple, ¾ in. long, in head-like clusters, fertile stamens 3. Wash. to Calif.

Purdyi: *B. minor.*

stellaris (*Hookera stellaris*). To 6 in.: fls. violet-purple, ¾ in. long, fertile stamens 3. Calif.

terrestris. Very low, the mostly large umbel at or near the ground: fls. purple, wide open, ¾ in. long. Calif.

uniflora (*Milla uniflora. Triteleia uniflora. Leucocoryne uniflora*). Spring Star-Flower. To 8 in., with onion-like odor: fls. white tinged with blue, solitary, 1 in. long. Argentina. Var. **cærulea** has porcelain-blue fls. and **violacea** violet fls.

volubilis (*Dichelostemma* and *Stropholirion californicum*). Snake-Lily. To 3 ft. or twining to 8 ft.: fls. rose or pink, ⅔ in. long, fertile stamens 3. Calif.

BROMELIA. *Bromeliaceæ.* Trop. American terrestrial herbs with stiff spiny-margined lvs. in basal rosettes, and fls. in heads or panicles; planted in the tropics and sometimes in greenhouses. See *Bromeliaceæ.*

Pinguin. Pinguin. Lvs. to 6 ft. long and 1½ in. wide, light green, with hooked prickles: fls. white or pinkish, in mealy panicles shorter than lvs. W. Indies, S. Amer.

BROMELIACEÆ. Bromeliads. Bromelia or Pineapple Family. American herbs or subshrubs, of tropics or warm countries, mostly epiphytic, of about 40 genera, with usually long stiff lvs. often in rosettes, regular bisexual fls. in spikes, heads or branching panicles often with showy colored bracts and sometimes with ornamental fls., having 6 perianth-parts in 2 series, 6 stamens, 3-celled ovary and fr. a berry or caps. Several genera are grown for ornament, mostly under glass, and the pineapple for food, such as Æchmea, Ananas, Aregelia, Billbergia, Bromelia, Canistrum, Cryptanthus, Dyckia, Greigia, Guzmania, Nidularium, Pitcairnia, Puya, Rhodostachys, Tillandsia, Vriesia. Distinctions between the genera are mostly technically botanical and cannot be detailed here.

Many of the bromeliads, in several genera, make showy and effective greenhouse and conservatory subjects. Although many of the cultivated kinds are variously epiphytic in their native habitats, they are usually grown in pots, wire baskets or wooden cribs, in a soil of fibrous material. Growth is mostly in summer, when plenty of water should be supplied; bloom is usually best in the following late winter to early summer. The spikes of showy bracts and often of colored flowers make the plants unusually attractive. Most bromeliads require a night temperature in the winter of 50–75°, and plenty of light and sunshine. In winter only a light sprinkling over the foliage is necessary. Propagated by suckers or sprouts from the base of the old plants.

BROMUS. Brome-Grass. *Gramineæ.* Ann. and per. grasses with flat lvs. and usually drooping spikelets in open terminal panicles; mostly natives of the north temp. zone, some kinds grown for forage and others for the flower-garden. See *Grasses.*

brizæformis. Quake-Grass. Ann. to 2 ft.: lvs. to 8 in. long and ¼ in. wide: spikelets ovate-oblong, flattened, to 1 in. long, awnless, in panicles to 8 in. long, the branches nodding. N. Eu., Asia; nat. in N. Amer.—Useful in dry bouquets.

erectus. Per. to 3 ft.: lvs. to 1 ft. long and ⅙ in. wide: spikelets to 1½ in. long, awned, in panicles to 7 in. long, the branches erect. Eu.; nat. in E. N. Amer.

inermis. Hungarian or Awnless B. Per. to 4 ft.: lvs. to 1 ft. long and ¼ in. wide: spikelets oblong, to 1 in. long, awnless, in panicles to 10 in. long, the branches ascending. Eu.; grown in pastures and sometimes escaped.

intermedius (*Serrafalcus Hughi*). Ann. or bien. to 1½ ft.: spikelets 1 in. long, greenish or yellowish, in panicles to 4 in. long. Medit. region.

japonicus (*B. patulus*). Ann. to 2 ft.: lvs. to 8 in. long and ¼ in. wide: spikelets lanceolate, to 1 in. long, awned, in panicles to 8 in. long, the branches nodding. Eu., Asia; sparingly nat. in N. Amer.

macrostachys. Ann. to 2 ft.: lvs. to 6 in. long and ¼ in. wide: spikelets to 1½ in. long, flattened, with awns to ¾ in. long, in panicles to 4 in. long, the branches erect. Eu., W. Asia.—Grown for ornament. Var. **lanuginosus** has lvs. and spikelets pubescent.

madritensis. Ann. to 2½ ft.: lvs. to 8 in. long and ¼ in. wide: spikelets to 2 in. long, with awns to ¾ in. long, in dense panicles to 6 in. long, the branches erect. Eu.; escaped in N. Amer.—Grown for ornament.

patulus: *B. japonicus.*

pendulinus. Per. to 3 ft.: lvs. to 6 in. long and ⅙ in. wide: spikelets to ¾ in. long, awned, in panicles to 6 in. long. Mex.

unioloides (*Ceratochloa pendula*). Rescue-Grass. Ann. or bien. to 3 ft.: lvs. to 1 ft. long and ⅓ in. wide: spikelets to 1 in. long, much flattened, awnless, in panicles to 10 in. long, the branches ascending. S. U. S. to S. Amer.—Grown for forage in the S.

BROOKLIME, EUROPEAN: *Veronica Beccabunga.*

BROOM: *Cytisus, Genista, Spartium.* **Butchers:** *Ruscus aculeatus.* **Climbing Butchers:** *Semele androgyna.*

BROSIMUM. *Moraceæ.* Trop. American milky-juiced trees with alternate entire leathery lvs., staminate fls. of a single stamen, pistillate fls. and frs. immersed in the fleshy receptacle; grown in trop. regions for the nuts, and for the lvs. which are used for fodder. Propagated by cuttings over heat.

Alicastrum. Breadnut. To 100 ft.: lvs. oblong, to 7 in. long and 2½ in. wide: fr. globose, about 1 in. across, yellow, with a single large seed which is eaten and roasted. Mex., Cent. Amer., W. Indies.

BROUGHTONIA. *Orchidaceæ.* A small genus of W. Indian epiphytic orchids of which one is sometimes cult. under glass. B. sanguinea. Pseudobulbs 2 in. long, bearing 2–4 leathery lvs. about 2 in. long: scapes to 1½ ft. tall, bearing racemes of crimson-purple fls. about 1½ in. across, May–June. Cuba, Jamaica.

BROUSSONETIA. Paper-Mulberry. *Moraceæ.* Deciduous trees or shrubs with milky juice, alternate toothed often lobed lvs., staminate fls. in drooping catkins, pistillate in globose heads, and fr. a small syncarp composed of orange-red drupelets; native in E. Asia, where the bark is used for making paper.

Propagated by seeds, suckers, cuttings of green or ripe wood in a cool greenhouse, root-cuttings over slight heat, and by layers. Varieties may also be grafted in spring in the greenhouse on roots of the type or budded in summer.

papyrifera (*Papyrius papyrifera*). To 50 ft.: lvs. ovate, to 8 in. long, usually deeply lobed, grayish-pubescent beneath: syncarp tomentose, ¾ in. across. China, Japan; much planted as a street tree and nat. N. Y. to Fla. and Mo. Var. **laciniata,** lvs, finely dissected. Var. **leucocarpa,** fr. white. Var. **variegata,** lvs. variegated white or yellow. Hardy in central states, and farther north in protected places.

secundiflora: *Sophora secundiflora.*

BROWALLIA. *Solanaceæ.* Annuals grown in the garden or greenhouse for the blue, violet or white tubular fls. with spreading 5-lobed limb, which are solitary and axillary or in more or less one-sided racemes; lvs. usually simple; native in trop. Amer. and of the simplest cult.

americana (*B. demissa. B. elata*). To 2 ft., glabrous or somewhat pubescent, not viscid: lvs. ovate, to 2½ in. long: fls. blue or violet, tube ½ in. long and limb ½ in. across, segms. 2-lobed, calyx hairy. Trop. Amer. Var. **alba** has white fls. and **nana** is dwarf.

Czerwiakowskii: *B. viscosa.*

demissa: *B. americana.*

elata: *B. americana.*

grandiflora (*B. Roezlii*). Similar to *B. americana,* with white or pale blue broader fls. and glabrous calyx. Peru.

Jamesonii: *Streptosolen Jamesonii.*

major: *B. speciosa.*

pulchella: *B. viscosa.*

Roezlii: *B. grandiflora.*

speciosa (*B. major*). To 5 ft., shrubby at base: lvs. ovate: fls. with tube 1 in. long, limb dark purple, pale lilac beneath, varying to blue, violet and white, to 2 in. across, segms, entire. Colombia.

viscosa (*B. Czerwiakowskii. B. pulchella*). To 1 ft., sticky-hairy, at least on young parts: lvs. ovate: fls. dark blue with white eye, or white, to ¾ in. long, the segms. short and 2-lobed. S. Amer.—Some of the stock otherwise named belongs here.

BROWNEA (*Hermesias*). *Leguminosæ.* Small trees native in trop. Amer., with leathery pinnate lvs. and very showy red fls. in racemes or dense heads; sometimes planted in the warmest parts of the country.

capitella. Lfts. 9 in. or more long, long-acuminate: fls. in dense heads about 11 in. across, the stamens long-exserted. Venezuela.

grandiceps. Lfts. about 7 in. long, caudate: fls. in dense heads about 9 in. across. S. Amer.

latifolia. Lfts. to 4 in. long and 2 in. wide, pointed: heads small, stamens slightly protuding. Trinidad, Venezuela.

macrophylla. Partially climbing shrub to 18 ft.: lfts. tomentose beneath: heads to 6 in. across, borne near base of trunk. Panama, Colombia.

Rosa-de-monte (*B. rosea*). Lfts. 3–4 in. long, abruptly acuminate: fls. in heads. S. Amer.

rosea: *B. Rosa-de-monte.*

BROWN-EYED SUSAN: *Rudbeckia triloba.*

BRUCKENTHALIA. *Ericaceæ.* One evergreen heath-like shrub to 10 in. high, adapted to the rock-garden and hardy N. Propagated by seeds and cuttings. **B. spiculifolia.** Spike-Heath. Lvs. crowded, linear, about 15 in. long: fls. pink, very small, bell-shaped, in racemes to ¾ in. long, the style exserted, in summer. S. Eu., Asia Minor.

BRUGMANSIA: *Datura.*

BRUNELLA: *Prunella.*

BRUNFELSIA (*Franciscea*). *Solanaceæ.* Shrubs and trees usually winter blooming, with mostly large showy often fragrant funnel-shaped fls. in loose or dense terminal cymes or sometimes solitary: lvs. alternate, simple and entire. Native in trop. Amer., a few grown in conservatories and in the open in Fla. and S. Calif. Linnæus, in 1753, spelled the name Brunsfelsia, but in Genera, 1754, Brunfelsia, apparently a correction.

Brunfelsias need a rich loose compost and liberal feeding during their growing season, blooming best if pot-bound. They should have a night temperature of 50°. Propagated by cuttings from the new growth in spring or in autumn from pieces of ripened wood.

americana. Lady-of-the-Night. Shrub to 8 ft.: lvs. oval to obovate, to 4 in. long: fls. white fading to yellow, mostly solitary, the slender tube to 4 in. long and limb to 2 in. across, very fragrant at night; calyx short: fr. a yellow berry ¾ in. diam. W. Indies.

calycina. Erect or spreading: lvs. ovate-oblong, to 4 in. long, dark green above, lighter below: fls. rich dark purple, limb 2 in. across, in few-fld. mostly terminal cymes; calyx with tube to 1 in. long, half or more length of corolla-tube. Brazil. Var. **eximia,** fls. rich purple soon fading to almost pure white. Var. **floribunda** (*B. floribunda*), dwarf, fls. rich violet with small white eye. Var. **macrantha** (*B. grandiflora, B. macrantha*), lvs. rich dark green, to 8 in. long, fls. rich deep purple with lavender-blue ring around white eye at mouth of tube. Peru.

capitata. Shrub: lvs. obovate-oblong, to 9 in. long: fls. in many-fld. cymes, corolla-tube slightly longer than calyx which is 1 in. long. Brazil.

floribunda: *B. calycina* var.

grandiflora: *B. calycina* var. *macrantha.*

Hopeana. Slender branching shrub: lvs. lanceolate-oblong, to 3 in. long, rich dark green: fls. small, solitary or in pairs along the leafy growths, limb light violet-blue changing to nearly white, tube nearly white, 1 in. long; calyx ¾ in. long. Brazil, W. Indies.

latifolia. Rather dwarf: lvs. oval, to 4 in. long: fls. nearly white to lavender and purple with lighter center, solitary or in few-fld. clusters, tube 1 in. long, limb 1½ in. across; calyx short. Trop. Amer.

macrantha: *B. calycina* var.

macrophylla. Shrub: lvs. oblong, to 9 in. or more long: fls. in loose many-fld. cymes, corolla-tube twice as long as calyx. Brazil.

BRUNIACEÆ. Brunia Family. About a dozen genera of heath-like subshrubs, mostly in S. Afr. but extending to S. Australia, placed in the sequence near Hamamelidaceæ and Saxifragaceæ. The family is characterized by small bisexual and regular fls., with the parts mostly 4 or 5, and a dry fr. with commonly 2 parts. Only Audounia appears to be cult. in N. Amer., and this is likely to be listed under Diosma, one of the Rutaceæ.

BRUNNERA. *Boraginaceæ.* A small herbaceous genus of W. Siberia and E. Medit. region, usually referred to Anchusa, but of different habit, broad netted-veined lvs. and naked infl.

macrophylla (*Anchusa myosotidiflora*). Per. to 1½ ft.: lvs. ovate, heart-shaped at base: fls. blue, ¼ in. across, in summer. Siberia, Caucasus.

BRUNSDONNA. Hybrids between *Amaryllis Belladonna* and *Brunsvigia Josephinæ.* Such hybrids have been produced crossing either way, those with Amaryllis seed parent apparently being more satisfactory horticulturally.

BRUNSVIGIA. *Amaryllidaceæ.* S. African summer- and autumn-flowering bulbs having basal lvs. and red or pink funnelform fls. in umbels terminating the scape.

Brunsvigias require rich sandy soil together with heat and sunlight. After flowering the bulbs should be rested. Propagated by offsets.

Josephinæ (*Amaryllis Josephinæ*). JOSEPHINES-LILY. To 1½ ft.: lvs. to 3 ft. long and 2 in. wide, ribbed: fls. bright red, 3 in. long, the tube about ½ in. long.

BRUSSELS SPROUTS (*Brassica oleracea* var. *gemmifera*). Biennial, the first year from seed producing little heads or "sprouts" in the leaf-axils, and the second year bearing seeds. The culture is essentially that for kale except that it is always a fall crop, the seed being sown in spring in a seed-bed and the younglings transplanted in late spring or summer, 18–30 inches apart in rows for the large kinds with sufficient space between (say 3 feet) to allow of pleasant tillage; dwarf varieties may be grown with less space. The "sprouts" attain a diameter of 1 or 2 inches; they are gathered as they mature from the bottom upwards, and a good plant should yield about one quart. As the sprouts attain form and considerable size, the subtending leaf is removed, the terminal crown of foliage maintaining the vigor of the plant. The crop is desired after frosty weather comes. The little sprouts or buttons are amongst the most delicate products of the cabbage tribes; they are best when not too large, say an inch or even less in diameter. The insects and diseases are those of the cabbage.

BRYANTHUS: *Phyllodoce Breweri.*

BRYONIA. BRYONY. *Cucurbitaceæ.* Herbs with per. more or less fleshy or tuberous root, mostly diœcious, one of them seldom grown in this country as an ornamental or arbor vine: fls. not large, the staminate in racemes, the pistillate few or solitary in axils: species 7 or more, in temp. Eu. and W. Asia.

dioica. To 10 or 12 ft., from fleshy tuber or strands: lvs. palmately 5-lobed, rough: fls. greenish, to ¾ in. across: fr. a smooth red berry ¼ in. diam. Eu., W. Asia, N. Afr.

BRYONOPSIS. *Cucurbitaceæ.* Two ann. tendril-climbing herbs, Asia, Afr. and Pacific Isls., one of which may be grown as an ornamental vine: plant monœcious: fls. small and greenish, fascicled and mostly in the axils.

laciniosa. Sts. slender, glabrous, tall-climbing: lvs. deeply 3–5-lobed, with obtuse sinuses: fr. yellow-green to reddish and striate, nearly ¾ in. diam.

BRYONY: *Bryonia.* **Black**: *Tamus communis.*

BRYOPHYLLUM. *Crassulaceæ.* Old World trop. fleshy perennials with opposite simple or pinnate lvs. and nodding or hanging fls. in large cymes or panicles, the corolla-tube included in a much-inflated calyx.

They are of simple culture but do not withstand frost. Propagated by stem-cuttings and seeds but more readily by placing a leaf on wet sand in a warm light propagating frame or even laying it on the ground; from the notches of the leaf young plants will grow and these may be potted when of sufficient size.

calycinum: *B. pinnatum.*

crenatum. To 3 ft.: lvs. ovate, to 3 in. long, coarsely toothed: fls. with pink inflated calyx and red corolla ¾ in. long. Madagascar.—It has been mistakenly written *cruentum*.

pinnatum (*B. calycinum*). AIR-PLANT. LIFE-PLANT. FLOPPERS. To 6 ft.: lvs. of 3–5 oval or oblong lfts. to 5 in. long: fls. with greenish- or yellowish-white purple-tinted inflated calyx and reddish corolla to 3 in. long. Probably E. India but run wild in warm regions.

BUCARE: *Erythrina Poeppigiana.*

BUCHU: *Diosma ericoides.*

BUCKBEAN: *Menyanthes trifoliata.*

BUCKBERRY: *Gaylussacia ursina.*

BUCKEYE: *Æsculus, Ungnadia.*

BUCKLEYA. *Santalaceæ.* Deciduous parasitic shrubs with opposite entire lvs., staminate fls. in umbels, pistillate solitary, and drupaceous frs.; 3 species in China, Japan, and N. Amer.

As the cultivated species is parasitic on the roots of Tsuga, seeds must be sown in a pot with the host plant and set out with the hemlock. Hardy in New England.

distichophylla. To 12 ft.: lvs. ovate to ovate-lanceolate, to 2½ in. long, sessile: fls. greenish, small: fr. yellowish-green, about ½ in. long. N. C., Tenn.—A graceful shrub.

BUCKTHORN: *Rhamnus.* **False**: *Bumelia lanuginosa.* **Sea-**: *Hippophaë.*

BUCKWHEAT: *Fagopyrum.* **-Tree**: *Cliftonia monophylla.* **Wild**: *Eriogonum fasciculatum.*

BUDDING: see *Graftage.*

BUDDLEJA (*Buddleia*) BUTTERFLY-BUSH. *Loganiaceæ.* Shrubs or rarely herbs, deciduous or evergreen, bearing stellate, glandular or scaly pubescence, with mostly opposite lanceolate lvs., 4-lobed fls. in heads, panicles or spikes, and fr. a 2-valved caps.; several showy species are grown for ornament.—Spelled *Buddleja* by Linnæus, but the *i* and *j* have the same phonetic value.

Even when buddlejas are not hardy North, the roots may survive with winter protection; but some of the species stand the winter in New York. They thrive in sunny locations in rich well-drained soil. Propagated by seeds sown over heat in spring, by cuttings of green wood, and by cuttings of ripe wood kept over winter in a frost-proof room.

alternifolia. To 12 ft. or more, branches drooping or arching: lvs. alternate, to 4 in. long, gray-tomentose beneath: fls. lilac-purple, in dense clusters to ¾ in. long, June. China.

amplissima: hort. name.

asiatica. Lvs. to 8 in. long, entire or fine-toothed, white- or yellow-tomentose beneath: fls. white, fragrant, in drooping spikes to 9 in. long, in winter and spring. China to India.—Grown under glass; in the open adaptable only in southernmost parts.

caryopteridifolia. To 6 ft.: lvs. ovate to oblong, to 2½ in. long, with large irregular teeth, tomentose: fls. lavender, in narrow panicles to 3 in. long. China; not hardy N. but in Calif.

Colvilei. To 30 ft.: lvs. to 7 in. long, toothed, pubescent: fls. purple or crimson with white eye, in drooping panicles to 1½ ft. long. Himalayas; to be grown far S.

curviflora: *B. japonica.*

Davidi (*B. variabilis*). SUMMER LILAC. To 15 ft.: lvs. to 10 in. long, finely toothed, dark green above, white-tomentose beneath: fls. lilac with orange eye, fragrant, in spikes to 10 in. long, in late summer. China.—One of the hardiest and probably commonest. Var. **magnifica** has larger rose-purple fls. in dense spikes. Var. **nanhoensis** grows to 5 ft. high with lvs. to 4½ in. long. Var. **superba** resembles *magnifica* but has larger panicles. Var. **Veitchiana** bears mauve-colored fls. in large dense spikes. Var. **Wilsoni** has rose-lilac fls. in drooping spikes to 2 ft. long.

Farquharii. Hybrid between *B. officinalis* and *B. asiatica*: lvs. yellow-tomentose beneath: fls. pale pink, in spikes; adaptable S.

globosa. To 15 ft.: lvs. to 10 in. long, wavy-toothed, yellow-tomentose beneath, wrinkled above: fls. orange, fragrant, in dense long-stalked heads ¾ in. across, June. Peru; planted in Calif.

intermedia. Hybrid between *B. Lindleyana* and *B. japonica*: lvs. to 6 in. long: fls. violet, in drooping panicles to 8 in. long. Var. **insignis** has rosy-violet fls. in erect spikes.

japonica (*B. curviflora*). To 6 ft., with 4-winged branchlets: lvs. to 8 in. long, slightly toothed, tomentose beneath when young: fls. lilac, in drooping panicles to 8 in. long, in summer. Japan.

Lindleyana. To 6 ft., with 4-angled branchlets: lvs. to 4 in. long, slightly toothed, nearly glabrous beneath: fls. purplish-violet, in erect spikes to 8 in. long, in summer. China; not hardy N.

madagascariensis. To 20 ft.: lvs. to 5 in. long, dark green above, white- or yellow-tomentose beneath: fls. orange, in panicles, in winter. Madagascar; stands in Calif. and other mild climates.

nanhoensis: *B. Davidi* var.

nivea. To 10 ft.: lvs. to 10 in. long, coarsely toothed, dark green above, white-tomentose beneath: fls. lilac or purple, in dense spikes to 6 in. long, corolla tomentose outside, in late summer. China. Var. **yunnanensis** has lvs. pubescent above and yellow-tomentose beneath.

officinalis. To 10 ft.: lvs. to 6 in. long, entire or fine-toothed, gray-pubescent above, white- or yellow-tomentose beneath: fls. lilac with orange eye, fragrant, in panicles 6 in. long, in winter and spring. China; adapted only far S.

paniculata. To 15 ft.: lvs. to 5 in. long, coarsely toothed, pubescent above, white or yellow-tomentose beneath: fls. lilac with white eye, fragrant, in panicles to 4 in. long, in summer. Himalayas.

salvifolia. To 10 ft.: lvs. to 6 in. long, finely toothed, rusty-tomentose beneath, pubescent above: fls. yellowish-white with orange throat. in panicles to 6 in. long. Trop. and S. Afr.

variabilis: *B. Davidi.*

BUFFALO-BERRY: *Shepherdia argentea.*

BUGBANE: *Cimicifuga.*

BUGINVILLÆA (see page 8). *Nyctaginaceæ.* The cult. kinds grown as woody vines but may be trained as standards, in the open far S. and in greenhouses N.: lvs. simple, alternate, ovate to elliptic-lanceolate, commonly entire: fls. inconspicuous, inclosed by showy mauve, magenta, purple or red corolla-like bracts: native in S. Amer. Many forms bear Latin names as though they were species.

Of easy cultivation in any soil, thriving best in full sunshine; in the North grown as pot-plants in a cool greenhouse. Propagated by cuttings, some kinds more easily than others.

brasiliensis: *B. spectabilis.*

glabra. Glabrous or nearly so: lvs. slender-pointed and with narrow base: bracts purple or magenta, running into lighter shades. Brazil. Var. **Cypheri** is larger with deep rose bracts. Var. **Sanderiana**, PAPER-FLOWER, is a floriferous form. Var. **variegata** has lvs. variegated with white.

Harrisii. Lvs. dark green marbled with creamy-white; probably a form of *B glabra.*

spectabilis (*B. brasiliensis*). More or less pubescent or tomentose: lvs. short- or blunt-pointed and broad at base: bracts in shades of red. Brazil. Var. **Crimson Lake** has bright crimson bracts, and var. **lateritia** brick-red bracts. Yellow bracts are reported.

BUGLE-WEED: *Ajuga.*

BUGLOSS: *Anchusa.* Vipers-: *Echium.*

BULBINE. *Liliaceæ.* Herbs from Australia and Afr., having bulbs or tuberous roots, linear or lanceolate lvs., and usually yellow fls. in racemes; seldom grown under glass or in the open in warm regions; bloom in spring and summer.

alooides. Stemless per. with tuberous rootstock: lvs. to 9 in. long: fls. bright yellow, ¼ in. long, in racemes to 1 ft. long. S. Afr.

annua. Stemless ann. without rootstock or bulb: lvs. to 1 ft. long: fls. bright yellow, ¼ in. long, in racemes to 6 in. long on scapes. S. Afr.

BULBINELLA. *Liliaceæ.* Per. herbs with fleshy tuberous roots, linear basal lvs. and yellow or white fls. in a dense raceme terminating the naked scape; native in S. Afr. and New Zeal. Grown in the border where they do best in rich moist soil; useful in warm regions. Propagated by division or seed.

Hookeri (*Chrysobactron Hookeri*). To 3 ft.: fls. bright yellow, ⅓ in. across, in racemes to 10 in. long. New Zeal.

BULBOCODIUM. *Liliaceæ.* One crocus-like cormous herb native in Eu. and Asia. **B. vernum.** Lvs. radical, narrow: fls. violet-purple, funnelform, 1–3 from each bulb and borne close to the ground in very early spring in advance of full leafage, the narrow segms. 2 in. long. For cult. see *Crocus.*

BULBOPHYLLUM. *Orchidaceæ.* Epiphytes having pseudobulbs which bear 1 or 2 lvs. and from the base the scape with a raceme of fls. or sometimes fls. solitary, having petals smaller than the sepals and a fleshy strap-shaped lip; grown in a warm greenhouse. See *Orchids.*

appendiculatum (*Cirrhopetalum appendiculatum*). Fls. about 8 in. long, solitary, with petals and dorsal sepal white lined with purple and tipped with purple fringe, and thick bright purple lip. E. Indies.

barbigerum. Pseudobulbs 1 in. long, with 1 lf. to 3 in. long and 1 in. wide: fls. in 8–14-fld. racemes to 6 in. long, the sepals dull purple, the lip green with brown markings, hairy and tipped with long purple hairs, June–July. Trop. Afr.

Careyanum. Pseudobulbs to 2½ in. high, with 1 lf. to 9 in. long and 1½ in. wide: fls. in nodding racemes to 3½ in. long, yellow thickly spotted with red-brown, Jan.–May. Himalayas.

comosum. Pseudobulbs 1½ in. high, with 1 broad lf. to 8 in. long: fls. small, yellowish-white, in dense racemes on scapes to 8 in. high, the lip yellow, Jan. Burma.

congolanum. Pseudobulbs 1 in. high, with 2 lvs. to 3 in. long and ½ in. wide: fls. pale yellow, in racemes on flattened red scapes. W. Afr.

Cumingii (*Cirrhopetalum Cumingii*). Lvs. to 4 in. long: fls. purple, in 9–12-fld. umbels, with fringed petals and dorsal sepal and fleshy lip. Philippine Isls.

cupreum. Differing from *B. Careyanum* in the copper-yellow fls. and the purplish-brown lip, Feb.-Apr. Philippine Isls.

cylindraceum: a listed name.

Dayanum. Pseudobulbs about 1¼ in. high, with 1 narrow lf. to 4 in. long: fls. about 1 in. across, in 2–3-fld. clusters, the sepals yellow-green spotted with red and hairy, the petals half as long and purple-red edged with green, the lip pale purple edged with green and covered with warts, May–July. Burma.

Dearei. Pseudobulbs 1½ in. high, with 1 strap-shaped lf. to 6 in. long: fls. solitary, large, the sepals brownish-yellow spotted with red, the petals shorter, yellow marked with red, the lip white finely dotted with red, May–June. Philippine Isles.

falcatum (*Megaclinium falcatum*). Pseudobulbs about 3 in. high, with 2 lvs. to 7 in. long and 1½ in. wide: fls. golden-brown, May–June. W. Afr.

grandiflorum. Pseudobulbs to 3 in. high, with 1 lf. to 8 in. long and 2½ in. wide: fls. solitary on scapes to 10 in. long, very large, the sepals brownish-green with white transparent dots, the petals very small, the lip small, greenish dotted with brown and hairy on edge, Oct. New Guinea.

Lobbii. Pseudobulbs to 2 in. high, with 1 lf. to 8 in. long and 2 in. wide: fls. solitary, 4 in. across, the sepals and petals yellow spotted or lined outside with red, the lip golden-yellow, May–June. Java to Sumatra.

Medusæ (*Cirrhopetalum Medusæ*). Lvs. to 6 in. long and 2 in. wide: fls. pale yellow spotted at base with red, in many-fld. umbels, the lateral sepals prolonged into tails to 6 in. long, Oct.–Dec. Malaya.

odoratissimum. Pseudobulbs to 1½ in. high, with 1 linear-oblong lf. to 3 in. long: fls. small, in dense globose heads, yellow, fragrant. India to China.

picturatum (*Cirrhopetalum picturatum*). Lvs. to 6 in. long and 1½ in. wide: fls. about 2 in. long, in 10-fld. umbels, sepals and petals green spotted with red, the upper sepal with a terminal red thread, the lip dark red, May–June. Burma.

pulchrum (*Cirrhopetalum pulchrum*). Fls. purple, in 7-fld. umbels, the lateral sepals yellow spotted with purple, over 1 in. long. Malaya.

refractum (*Cirrhopetalum refractum*). WINDMILL ORCHID. Lvs. lanceolate, to 5 in. long: fls. yellow, 2½ in. long, the lip spotted with red. Himalayas.

Reinwardtii. Pseudobulbs to 4 in. high, with 1 elliptic lf. to 8 in. long: fls. about ¾ in. long, yellowish tinged with crimson. Java.

Roxburghii (*Cirrhopetalum Roxburghii*). Lvs. linear-oblong, to 4 in. long: lateral sepals yellow; petals and dorsal sepal yellow striped with red; lip red-purple. India.

saurocephalum. Pseudobulbs bearing 1 oblong lf.: fls. in many-fld. racemes with a bright red rachis, the sepals light yellow lined with brown, petals small and white bordered with reddish, lip yellow, deep purple at base. Philippine Isls.

suavissimum. Pseudobulbs 1 in. high, with 1 lanceolate lf. to 4 in. long: fls. bright rose or whitish, the lip yellow, in many-fld. arching racemes to 8 in. long, June–July. Burma.

Thouarsii (*Cirrhopetalum Thouarsii*). Lvs. to 7 in. long and 1½ in. wide: fls. bright yellow, 2 in. long, in 5–8-fld. umbels, the petals with a thread-like tail, July. Madagascar, Mauritius.

virescens. Pseudobulbs about 5 in. high, with 1 lf. to 1 ft. long and 5 in. wide: fls. large, in umbels, the sepals and petals greenish-yellow, the lip yellow spotted with red, June. Moluccas.

BULBS, as a class in horticultural terminology, are ornamental partial-season mostly simple-stemmed plants arising from bulbs, corms, tubers or thickened rootstocks that may be cured and dried off and stored over winter. The term is incapable of close definition: it includes crocuses, tulips, hyacinths, narcissi, squills, lilies, amaryllids and similar groups. It specially denotes spring-blooming subjects. Because of their quick growth and showy bloom, bulbs are unceasing favorites with cultivators. For more particular mention the reader is referred to the different classes under their alphabetic entries.

The outdoor culture of the common bulbs is simple. The plants care for themselves throughout a greater part of the year, many of them flowering very early when no other kinds are able to grow and bloom out-of-doors. Success depends to a large degree on good stock to begin with. Not only should the varieties be good and true to name, but the bulbs themselves should be well ripened and firm although it is not necessary to choose the biggest ones. While the so-called Holland bulbs thrive in any kind of soil, they all do better in deep sandy ground well enriched with well-rotted manure; but do not let the manure come into direct contact with the bulb. Even heavy clay may be fitted for the growing of bulbs by the addition of sharp sand, either worked into the soil or placed directly under the bulb when planted.

To make a bulb bed, choose, if possible, a light or loamy soil and throw out the top earth to the depth of 6 inches. Put into the bottom of the bed about 2 inches of well-rotted (not fresh) manure and spade it into the soil. Throw back half of the top soil, level it off nicely, set the bulbs firmly on this bed and then cover them with the remainder of the soil; in this way one will have the bulbs from 3 to 4 inches below the surface and of uniform depth. When the weather is cold enough to freeze a hard crust the bed should have its winter covering. This may be straw, hay, cornstalks or leaves spread over the bed to the depth of 6 inches if the material is coarse; but if leaves are used, 3 inches will be enough, because the leaves lie close together and may smother out the frost that is in the ground and let the bulbs start. If they start too early the hard freezes of March and early April will spoil their beauty if the leaves or flowers are near or above the surface. Early in April, in New York, the covering may be removed gradually, and should all be off the beds before the leaves show above the ground. Some of the bulbs may be readily naturalized in grassy and untilled areas, as grape-hyacinth, crocus, jonquil, daffodil, lily-of-the-valley, tulip. The plants are usually massed irregularly for pleasing and striking effect. The area may be fertilized in autumn with top-dressing.

The growing of flowering bulbs in winter adds to the list of house-plants a charming variety. Hyacinths, narcissi, tulips, and crocus can be made to flower in the winter without difficulty. Pot the bulbs by the middle or last of October, or if earlier all the better. The soil should be rich sandy loam, if possible; if not, the best one can get, to which add about one-fourth the bulk of sand and mix thoroughly. If ordinary flower-pots are to be used, put in the bottom a few pieces of broken pots, charcoal or small stones for drainage, then fill the pot with earth so that when the bulbs are set on it the top of the bulb is even with the rim of the pot. Fill around it with soil, leaving just the tip of the bulb showing. If the soil is heavy, a good plan is to sprinkle a small handful of sand under the bulb to carry off the water, the same as is in beds outdoors. If one does not have pots, boxes may be used. Starch boxes are a good size, as they are not heavy to handle; and excellent flowers are sometimes obtained from bulbs planted in old tomato cans. If boxes or cans are used, care must be taken to have holes in the bottoms for drainage. A large size hyacinth bulb will do well in a 5-inch pot. The same size pot will do for three or four narcissi or eight to twelve crocuses. After the bulbs are planted they should be placed in a cold pit or cellar, or on the shady side of a building, or, better yet, plunged or buried up to the rim of the pot in a shady border. This is to force the roots to grow before the top appears, as only the bulbs with good roots will give good flowers. When the weather is so cold that a crust is frozen on the soil, the pots should be covered with a little straw, and as the weather becomes colder more straw must be added. In six to eight weeks after planting the bulbs, they should have made roots enough to grow the plant, and the pots may be taken up and placed in a cool room for a week or so, after which, if plants have started into growth, they may be taken into a warmer room where they have plenty of light. They will grow very rapidly now and will want much water. When just coming into bloom the plants may have full sunlight part of the time to help bring out the color of the flowers. Crocuses and tulips open only in sunlight. After blooming in the house, the bulbs are usually discarded and new ones purchased for the following year, although it is possible to grow them on for future blooming.

BULLACE, DAMSON: *Prunnus domestica* var. *insititia.*

BULLATE: the surface blistered or puckered, as the leaf of a Savoy cabbage.

BULLOCKS-HEART: *Annona reticulata.*

BULRUSH: *Scirpus.*

BUMELIA. *Sapotaceæ.* Evergreen or deciduous often thorny shrubs and trees in S. U. S. and southward with very hard wood, one sometimes transferred to grounds in its region: lvs. mostly fascicled or crowded on short spurs: fls. small, white, fascicled in axils: fr. small, black, drupe-like.

lanuginosa. CHITTAMWOOD. FALSE BUCKTHORN. Deciduous tree to 25 ft., but the oblong-obovate thick lvs. persisting late, tomentose underneath, entire, 2–3 in. long: fr. about ⅓ in. long. Woods and copses, Va. to Fla. and west to Kans. and Tex.

BUNCHBERRY: *Cornus canadensis.*

BUNCH-FLOWER: *Melanthium.*

BUNYA-BUNYA: *Araucaria Bidwillii.*

BUPHTHALMUM. OX-EYE. *Compositæ.* Showy herbaceous perennials with large yellow heads of disk- and ray-fls. and alternate entire or toothed lvs.; pappus of scales united into a crown. Native in Eu. and W. Asia. Of easy cult. in the border, and mostly hardy N. Propagated by division; also by seeds and sometimes blooming first year.

cordifolium: *B. speciosum.*

grandiflorum. Perhaps synonymous with *B. salicifolium* but with long-acuminate nearly glabrous lvs. S. Eu.

salicifolium. To 2 ft.: lvs. oblong-lanceolate, toothed, white-hairy: heads solitary and terminal, to 2 in. across. S. Eu.—Spreads rapidly by underground parts.

speciosissimum (*Telekia speciosissima*). To 5 ft.: lvs. oval-cordate, clasping, toothed, hairy only on midrib below: heads solitary and terminal. S. Eu.

speciosum (*B. cordifolium. Telekia speciosa*). To 4 ft., pubescent: lvs. cordate-ovate, coarsely toothed, very large: heads 2–5, large. S. Eu., W. Asia.

BUPLEURUM. THOROUGH-WAX. *Umbelliferæ.* Old World herbs or shrubs with simple entire lvs., yellow fls. in compound umbels, and compressed frs.; suitable for dry sterile soils in warm climates, being grown for ornament.

fruticosum. Subshrub to 6 ft., evergreen or partially so: lvs. oblong, to 3½ in. long, leathery: umbels to 4 in. across, subtended by deflexed bracts. S. Eu.

BUR, BUTTER-: *Petasites.* New Zealand: *Acæna microphylla.*

BURDOCK: *Arctium.*

BURLINGTONIA FRAGRANS: *Rodriguezia venusta.*

BURNET: *Sanguisorba.*

BURNING-BUSH: *Dictamnus albus, Euonymus atropurpureus.*

BURSARIA. *Pittosporaceæ.* Shrubs or trees with alternate simple lvs., small fls. in terminal panicles, and fr. a flat caps.; one species grown in S. Calif. for ornament.

spinosa. Spiny shrub or small tree: lvs. to 1 in. long: fls. white: caps. about ¼ in. across. Australia.

BURST-WORT: *Herniaria.*

BUSH: shrub, particularly when dense and much branched.

BUSHMANS-POISON: *Acokanthera venenata.*

BUTIA. *Palmaceæ.* A few species of Cocos segregates but without the aspect of Cocos, Arecastrum, Rhyticocos or Syagrus, of warm-temp. Brazil to Uruguay, Paraguay and Argentina: short stocky monœcious feather-lvd. palms, trunk solitary and covered with lf.-bases or their scars and 3–15 ft. high, plant unarmed except for the spine-margined hard flattened or thin-edged petiole: lvs. stiffish, decurved beyond the middle, grayish- or glaucous-green; pinnæ standing well up from the rachis then curving, strongly conduplicate toward base, long and narrow: spadix from axils of lower lvs., the spathe not plicate or grooved outside; stamens 6, borne on upper part of spadix branches: fr. globose, ovoid or ovoid-conic, yellow or reddish, 1 in. long more or less, with a pulpy-fibrous or rather soft yellowish exterior, 3-celled but 1 or 2 seeds sometimes aborted; albumen not ruminate. The Butias are hardy palms, hardly regarded as real trees by planters, thriving in S. Calif., on the Gulf Coast and southward. See *Palm.*

Bonneti (*Cocos Bonneti. C. Gaertneri*). Low palm, the trunk 1–4 ft., small in all parts: pinnæ equally spaced, not aggregate, narrow: spadix 2 ft. or so, the spathe glabrous on outside; fls. and fr. small, the latter about ¾ in. long and four-fifths as broad, ovoid-conic and acute and held for a third or half its length in the enlarging perianth. Brazil.—See note under *Arikuryroba.*

capitata (*Cocos capitata. C. australis* of hort. *C. coronata* of hort. not of botanists). Variable in arrangement of pinnæ and character of fr.: trunk stout, to 12–20 ft. or more and 1½ ft. diam., becoming bare of lf.-bases at the bottom: lvs. long and gracefully curving; pinnæ many, to 2½ ft., whitish beneath, often 2–3 together; petiole glabrous, spiny at base: spadix 4–5 ft. long, spathe generally glaucescent: fr. ovoid, about 1 in. long or a little more at maturity and four-fifths as broad; nutlet elliptic, more or less acute; perianth deeply cup-like at base of fr. Brazil; commonly planted in S. Calif. and elsewhere. Var. **odorata** (*Cocos odorata*). Fr. depressed-globose, about ¾–1 in. lengthwise, at maturity broader than long; nutlet nearly spherical; fruiting perianth not cup-like, flattened and expanded under base of fr. Var. **pulposa** (*Cocos pulposa*). Fr. globose, only lightly depressed, very pulpy, 1¼–1½ in. lengthwise; nutlet and seed spherical; fruiting perianth cup-like but not deep.

eriospatha (*Cocos eriospatha*). Trunk stout, 4–10 ft., becoming naked below: spathe densely brown-tomentose on outside: pinnæ equally distant, not assembled unless at base of rachis, green above and somewhat glaucous underneath, petiole tomentose on margin at base: fr. small, nearly globular, ⅝–¾ in. either way, with a short abrupt point; nutlet globose; fruiting perianth shallowly cup-like. S. Brazil.—*Cocos Blumenavia*, planted in Calif., apparently belongs here.

Nehrlingiana (*Cocos Nehrlingiana*). Described as having very long and elegantly reclined glaucous-green lvs. to 10 ft. long: fls. violet-red, the spadix to 3 ft. long and much branched: fr. size of small cherry, red. Perhaps Argentina; name bestowed in Fla.; botanical identity undetermined.

Yatay (*Cocos Yatay*). Stout palm, trunk to 8 or 10 ft. and about 1½ ft. diam.: petiole glabrous and armed on margin; pinnæ numerous, about equally placed or somewhat aggregate near the base, glaucescent underneath: fr. ovoid-conic and acuminate, 1½–2 in. long and 1 in. or more thick; cup-like fruiting perianth ⅓–½ length of fr. Uruguay, Argentina. Var. **paraguayensis** (*Cocos paraguayensis*) has a narrower fr. ¾ in. or less thick and 1½ in. or less long.—*Cocos Yurumaguas*, planted in Calif., belongs here.

BUTNERIA: *Calycanthus.*

BUTOMACEÆ. Butomus Family. Four genera of aquatic per. herbs with basal lvs., bisexual fls. solitary or in umbels, having 3 sepals and petals, 9 or more stamens, and 6 or more ovaries. By some writers the genera have been placed in Alismaceæ. Butomus, Hydrocleys and Limnocharis may be grown in ponds and aquaria.

BUTOMUS. *Butomaceæ.* One erect aquatic herb native in Eu. and Asia, **B. umbellatus.** Flowering-Rush. Lvs. linear, to 3 ft. long: fls. rose-colored, 1. in across, in many-fld. umbels on naked rush-like scapes to 4 ft. high. Easily grown in ponds, hardy N. Propagated by division. Somewhat run wild in N. E.

BUTTER-AND-EGGS: *Linaria vulgaris.*

BUTTERCUP: *Ranunculus.* Bermuda: *Oxalis cernua.*

BUTTERFLY-BUSH: *Buddleja.*

BUTTERFLY-FLOWER: *Schizanthus, Bauhinia monarda.*

BUTTERFLY-WEED: *Asclepias tuberosa.*

BUTTERNUT: *Juglans cinerea.*

BUTTERWORT: *Pinguicula.*

BUTTON-BUSH: *Cephalanthus.*

BUTTONWOOD: *Platanus occidentalis.*

BUXACEÆ. Box Family. Herbs, shrubs or trees, with persistent foliage, of about 6 widely distributed genera, with simple lvs., monœcious fls. without petals, superior usually 3-celled ovary, and capsular or drupaceous fr. The ornamental genera Buxus, Pachysandra, Sarcococca and Simmondsia are cult.

BUXUS. Box. *Buxaceæ.* Evergreen shrubs with small opposite entire stiff lvs., very small fls. in little axillary clusters or spikes, and fr. a caps.

Extensively used for hedges and edgings, as the plants stand pruning and shearing well. Box is suited to any well-drained soil and thrives in partial shade. Plants may be set out in spring or in August and September. Propagated by hardwood cuttings, suckers or division, or layering. Seeds may be sown but the plants grow very slowly. Dwarf varieties may also be propagated by division. In protected or favored places both common species stand in parts of New York and central New England.

arborescens: *B. sempervirens* var.

balearica. To 30 ft.: lvs. larger and not so shining as *B. sempervirens.* Spain, Balearic Isls.

Fortunei: *B. microphylla* var. *japonica.*

japonica: *B. microphylla* var.

microphylla. To 3 ft. or often prostrate, branches conspicuously winged: lvs. somewhat obovate, broadest above middle. Japan. Var. **japonica** (*B. japonica. B. Fortunei*). To 6 ft.: runs into several forms, as **angustifolia** with long narrow lvs.; **aurea** with yellowish foliage; **latifolia** with broad lvs.; **rotundifolia** with large bluish-green lvs. Var. **koreana,** to 2 ft., Korea.

nana: dwarf forms of *B. sempervirens.*

sempervirens. Common B. To 25 ft., with 4-angled or slightly winged branches: lvs. elliptic, broadest about or below the middle. Eu., N. Afr., W. Asia. There are many forms in cult., such as: **angustifolia** (var. *salicifolia*) with long narrow lvs.; **arborescens** which grows to a small tree; **argenteo-variegata** (var. *argentea*), the lvs. edged with silvery-white; **aureo-variegata** (var. *aurea*), lvs. yellow or variegated with yellow; **bullata,** lvs. bullate, large; **elegans,** a variegated form with oblong lvs.; **Handsworthii,** a bushy type with large broad lvs.; **marginata,** lvs. edged with yellow; **myrtifolia,** a dwarf form with narrow lvs.; var. **rosmarinifolia,** a low kind with narrow lvs.; var. **rotundifolia** (var. *latifolia*) has broadly oval lvs.; var. **suffruticosa,** a dwarf form with small lvs.

suffruticosa: *B. sempervirens* var.

BYRNESIA. *Crassulaceæ.* One per. herb with a rosette of thick broad lvs., either basal or borne on a st. to 7 in. long. **B. Weinbergii** (*Echeveria Weinbergii. Cotyledon paraguayensis*). Lvs. obtusely keeled beneath, glaucous, to nearly 2 in. long: fls. white, in cymes from axils of upper lvs., seldom produced. Mex.—Of easy cult. from plantings of lvs. See *Graptopetalum.*

C

CABBAGE (*Brassica oleracea* var. *capitata*). One of the standard garden vegetables and truck crops, essentially a cool-season plant but growing continuously through the summer; in all stages it withstands considerable frost, although young plants from hotbeds must be hardened off. Soil should be deep and fertile, and it should be capable of holding abundant moisture to supply the heavy demands in growth. The cabbages of many kinds have been developed through centuries apparently from *Brassica oleracea* of coasts of western Europe. The varieties differ in season, in color and size and shape of head. The Savoy cabbages, which are of excellent quality, are a race with puckered or blistered (bullate) leaves. It is usual to classify by season into three groups, early, midseason, late or winter. Consult experiment station and government bulletins, and dealers' catalogues, for current varieties.

For very early and early crops, as of Wakefield and Jersey, seeds are usually sown in a hotbed or indoors a month at least before hard frosts are expected to cease. The seedlings may be transplanted once or twice, into larger pans or boxes or into other frames, to keep them stocky. At the later transplanting they should be given plenty of air, with reduction of temperature, to harden them for the field. In the field the plants are placed in rows 24–30 inches apart, and about 18 inches in the row.

For later and midseason crop, as of Winnigstadt, Succession, and All Season, seeds are commonly sown in the open in seed-beds as soon as sharp freezing is past, in rows 3 inches or more apart; from these rows they are usually transplanted directly to the field, the plants having been well thinned in the meantime if they begin to crowd. These later or main summer kinds are commonly given more room in the field, both because they grow larger and to allow for horse tillage.

Of the autumn and winter kinds, as Ballhead, Drumheads, and Flat Dutch, seeds are sometimes placed in hills where the plants are to stand, all plants but one being removed as they grow. A much better procedure, however, is to grow in seed-beds, sowing in mid-spring or even late spring, transplanting to the field in July in the North. The plants usually stand 2 feet apart in rows with 2½–3 feet space between. For winter storage only the long-keeping varieties should be employed; the heads should be mature and solid, free from injury and disease, internally moist and plump, but the center of the head should be free of water. They may be buried, usually heads down to keep them clear of water, or placed on racks in a building kept near freezing yet warm enough so that the heads do not freeze. When buried, care must be taken to choose a well-drained place, and if any quantity is stored provision should be made for ventilation; they are covered deeply enough to keep them cool in warm spells and also to protect from hard freezing in cold weather. If too warm they may rot. Usually 3 or 4 inches of earth are first placed on the pit or trench, and more added, or a straw covering applied, as cold weather advances. The heads are usually not more than two tiers deep.

In the midsouthern parts of the United States, cabbage plants are often started in autumn and carried over winter in the field; they are then ready for growth in earliest spring. Far South cabbage is treated as a winter or early spring crop, being grown continuously in the cool season.

Allowing for losses, 4 to 6 ounces of seed are generally required to produce sufficient plants for an acre.

Many insects and fungi attack cabbages. The grower should keep in touch each year with the new advice issuing from the experiment stations and departments of government. The root-maggot is often a serious pest; young plants in seed-beds may be protected from the egg-laying fly by covering securely with cheese-cloth; in the field, early plants may be protected by a disk of tarred paper slipped around the plant on the ground. The club-root fungus is best circumvented by long rotations in which related host-plants (crucifers) are not allowed; also by top-dressings of lime (75 bushels to acre) the previous autumn. The cabbage-worm is controlled by poison sprays; in the home garden by hand-picking, hellebore, insect powder, tobacco sprays, hot water (130° F.), and sometimes more or less by salt water; take special pains to destroy the first brood. The aphis or louse is controlled by very thorough spraying with Black-leaf 40 or the fish-oil and whale-oil soaps.

CABBAGE, SKUNK-: *Symplocarpus fœtidus*. Yellow: *Lysichitum*.

CABBAGE-TREE: *Andira inermis*; *Sabal Palmetto*, and other palms in the tropics.

CABOMBA. FANWORT. WATER-SHIELD. *Nymphæaceæ* (or *Cabombaceæ*). Aquatics of the western hemisphere, sometimes grown in ponds and aquaria: floating lvs. entire, submerged lvs. finely divided: fls. very small, with 3 sepals and petals. Grown from cuttings set in the earth in 1–2 ft. of water, by division of the plants, and by seeds.

aquatica of some authors: *C. caroliniana*.

caroliniana (*C. aquatica*. *C. viridifolia*). WASHINGTON PLANT. FISH-GRASS. Floating lvs. green, very narrow, to ¾ in. long: fls. axillary, ½ in. broad, white with 2 yellow spots at base of each petal. Ponds and slow streams, S. Ill. to Fla. and Tex. Var. **pulcherrima**, sts. reddish-purple, lvs. darker with narrow segms., petals bright purple, Ga. Var. **rosæfolia** has reddish lvs. and is more difficult to propagate than the type.

viridifolia: *C. caroliniana.*

CACALIA: *Emilia, Senecio succulentus.*

CACAO: *Theobroma Cacao.*

CACTI, CACTACEÆ. Cactus Family. There are about 1300 known species of cacti, now arranged in more than 100 genera. They are American plants, the few that occur wild in other parts of the world being probably spread from the western hemisphere. They are plants of varied habit, but in most kinds (with marked exception in Pereskia) the leaves are minute and indistinguishable to the general observer, or are very early deciduous, and the vital functions are performed by the green plant body. For the most part the cacti are spiny, the spines arising from cushions or areoles; often, as in Opuntia, the spines are accompanied by small easily detached barbed bristles or glochidia that penetrate the skin. In many or most cases some of the spines at the areole are spreading or radial and others more or less erect and central. The flowers are bisexual, mostly without well-defined distinction between calyx and corolla; they are often very showy, in white, yellow and shades of red. The fruit is mostly a fleshy berry-like body, sometimes edible. Cacti are grown for the odd shape of the plant body as well as for the flowers; sometimes the plant is rigidly columnar, or barrel-shaped or even globular; but there are slender climbing and trailing forms and massive tree-like structures. Cacti are fascinating to lovers of oddities and novelties, and any number of kinds may be brought into cultivation from the wild; in fact, much of the stock has been collected rather than propagated plants. In this book obviously only the more generally cultivated or mentioned species can be included. The genera represented in cultivation are Acanthocereus, Aporocactus, Ariocarpus, Astrophytum, Bergerocactus, Carnegiea, Cephalocereus, Cereus (now divided into many genera), Chamæcereus, Cleistocactus, Cochemiea, Coryphantha, Discocactus, Disocactus, Dolichothele, Echinocactus, Echinocereus, Echinofossulocactus, Echinomastus, Echinopsis, Epiphyllanthus, Epiphyllum, Epithelantha, Escobaria, Escontria, Ferocactus, Gymnocalycium, Hamatocactus, Harrisia, Hatiora, Heliocereus, Homalocephala, Hylocereus, Lemaireocereus, Lobivia, Lophophora, Machærocereus, Malacocarpus, Mamillopsis, Mammillaria, Mediocactus, Melocactus, Monvillea, Myrtillocactus, Neobesseya, Neolloydia, Neomammillaria, Nopalea, Nopalxochia, Nyctocereus, Opuntia, Pachycereus, Pediocactus, Pelecyphora, Peniocereus, Pereskia, Pereskiopsis, Phellosperma, Phyllocactus, Pilocereus, Rathbunia, Rhipsalis, Roseocactus, Schlumbergera, Sclerocactus, Selenicereus, Solisia, Strombocactus, Thelocactus, Trichocereus, Wilkcoxia, Zygocactus. See *Succulents*. The Cactus and Succulent Society of America publishes a journal in Los Angeles.

The Cactaceæ or Cactus Family divides itself into two rather marked groups, one of which is characterized by regular foliage leaves as in other plants and not looking much like cacti to the general observer, and the flowers are more or less stalked: to this group belongs the single genus Pereskia with about a score of species. The other group has no true foliage leaves, except in the anomalous genus Pereskiopsis, such leaves as appear being small or rudimentary and often falling early, and the flowers are without stalks. The second group divides itself into two tribes, the opuntia-like plants mostly bearing glochids on the areoles, the vegetative parts having small and short-lived leaves and the flowers rotate (wheel-shaped, without definite tube), and the cereus-like plants without glochids and leaves and the flowers mostly with definite and often very long tubes. To the Opuntia tribe belong seven genera, as now treated, only Opuntia and perhaps Nopalea being much known horticulturally. To the Cereus tribe belong all the other genera of the Cactaceæ, of which some of the most promnent horticulturally are Cereus, Cephalocereus, Echinocactus, Echinocereus, Echinopsis, Epiphyllum, Harrisia, Hylocereus, Mammillaria, Nyctocereus, Rhipsalis, Selenicereus, Zygocactus.

In the recent studies of cacti many new names have been introduced, but the familiar old names are given here as synonyms (in parentheses) so that the identities and relationships may be traced; and these synonyms also suggest the cultural requirements of plants under strange appellations.

Although most of the cacti are desert or dry-country plants, they need liberal supply of water in their growing period. For the most part they are summer bloomers and are more or less dormant in winter, when care should be taken not to over-water them, but they soon suffer in pots if allowed to be dry for any length of time, and they should not be grown close to hot pipes. Soils should be open in texture to insure proper drainage; sand and sometimes pounded brick are often added to the soil, and care should be taken not to have much fresh organic material in it. In summer, if placed out-of-doors, the plants are usually plunged rather than turned out of the pots.

Propagation is by offsets in the species that produce them, and most kinds grow readily from cuttings made of the stems or joints. The severed or cut surface should be allowed to dry in the air for several days, until it is seared or a corky layer has formed; the cutting is then inserted shallowly in sand in a pot or pan. Cacti start quickly from seeds, when they are available, and seed-grown plants commonly are more amenable under glass than those transplanted directly from the wild. Seeds should be sown only in sterilized soil. Seeds of some cacti, as of opuntias and echinocacti, germinate in a few days. The seedlings may remain in their pots or pans for several months or more before transplanting. When large enough they are transplanted to other pots or pans; and the shifting may then proceed as required, being careful not to use too large pots.

The cacti are easily grafted on other stocks. This practice is employed in order to provide weeping kinds with straight stout stems or standards, and also to propagate the many crested and contorted forms, and sometimes to elevate small globular kinds. Pereskia stocks are often employed, and also some of the strong columnar kinds of the Cereus group. The cacti graft rather indiscriminately. Any method of applying the cut surfaces of stock and cion together is satisfactory if the surfaces are held firmly in place by cords or thongs. Wax is not employed. The cleft-graft is perhaps most commonly used, but when small globular forms are grafted on columnar stocks it is necessary only to cut off squarely the top of the stock and the base of the cion and to set one on the other, and tie the parts firmly together.

CACTUS (as a genus): see *Melocactus.* **CACTUS** (as a popular name): **Christmas:** *Zygocactus truncatus.* **Crab:** *Zygocactus truncatus.* **Deerhorn:** *Peniocereus Greggii.* **Easter:** *Schlumbergera Gaertneri.* **Giant:** *Carnegiea gigantea.* **Hair-brush:** *Pachycereus pecten-aboriginum.* **Hatchet:** *Pelecyphora.* **Mistletoe:** *Rhipsalis cassutha.* **Old-Man:** *Cephalocereus senilis.* **Organ-Pipe:** *Pachycereus marginatus.* **Rainbow:** *Echinocereus rigidissimus.* **Rat-tail:** *Aporocactus flagelliformis.* **Redbird-:** *Pedilanthus tithymaloides.* **Sea Urchin:** *Echinopsis.* **Snowball:** *Pediocactus Simpsonii.* **Star:** *Astrophytum.* **Turks-Cap or -Head:** *Melocactus communis.* **Vine-:** *Fouquieria splendens.*

CÆSALPINIA. *Leguminosæ.* Armed or unarmed trees and shrubs, sometimes climbing, native in warm regions of both hemispheres, with 2-pinnate lvs., yellow or red fls., not papilionaceous, in racemes, and mostly flattened pods; planted for ornament in tropical and subtropical countries.

Propagated by seeds which will germinate more readily if soaked in warm water some hours before sowing. Transplant into pots as soon as seedlings show the first true leaf. In frostless regions the plants may soon be set permanently out-of-doors.

coriaria (*Libidia coriaria*). Divi-Divi. To 30 ft.: lfts. numerous and small: fls. yellow: pods oblong, curved, about 1 in. long. Trop. Amer.

Crista (*Guilandina Crista*). Nicker-Nut. Straggling more or less climbing prickly shrub: lfts. numerous, ovate: fls. yellow: pods oval, prickly, 2½ in. long. Trop. Amer.

echinata. Brazil-Wood. Tree with prickly trunk: lfts. numerous, rhombic-oblong: fls. yellow: pod oblong, 3 in. long. Brazil.

Gilliesii: *Poinciana Gillesii.*

japonica. Thorny shrub to 8 ft.: lfts. oblong: fls. canary-yellow with bright red stamens: pod 3 in. long. Japan.

mexicana. Shrub or small tree to 18 ft., unarmed: lfts. oblong to nearly orbicular: fls. yellow: pod 2½ in. long. Mex.

Nuga (*Ticanto Nuga*). Wood-Gossip. Prickly climbing shrub: lfts. ovate: fls. bright yellow: pod ovoid-oblong, 2 in. long. Malay Archipelago to S. China and Australia.

pulcherrima: *Poinciana pulcherrima.*

regia: *Delonix regia.*

Sappan (*Biancæa Sappan*). Prickly tree to 15 ft.: lfts. rhombic-oblong: fls. yellow: pod oblong, 3 in. long, beaked. India, Malaya.

sepiaria (*Biancæa sepiaria*). Mysore Thorn. Prickly scrambling shrub: lfts. oblong: fls. yellow: pod 3 in. long, beaked. India.

CÆSALPINIACEÆ: *Leguminosæ.*

CAFTA: *Catha edulis.*

CAILLIEA (*Dichrostachys*). *Leguminosæ.* Shrubs with finely divided acacia-like lvs., fls. in spikes, the upper ones bisexual and those on the lower half of spike with long slender staminodia, and flattened twisted pods; one species sometimes planted out-of-doors in S. Fla. and S. Calif. for ornament.

glomerata (*Dichrostachys nutans*). Spiny hard-wooded shrub or small tree: fls. sulfur-yellow on upper part of spike, rosy or lilac on lower part: pods in heads. Trop. Afr.—A serious pest in Cuba, where it is known as *Aroma.*

CAIOPHORA (spelled also *Cajophora*). *Loasaceæ.* S. American herbs usually with stinging hairs, opposite lvs., yellow, white or red fls., and capsular twisted frs.; one species cult. in the flower-garden. Propagated by seeds and cuttings.

lateritia (*Blumenbachia lateritia. Loasa lateritia. L. aurantiaca*). Ann., twining to 20 ft.: lvs. pinnate: fls. orange-red, to 2 in. across, on very long stalks.

CAJANUS. *Leguminosæ.* One shrub native probably in the Old World. C. Cajan (*C. indicus*). Pigeon-Pea. Cajan. Much cult. in trop. countries for the edible small truncate-orbicular somewhat flattened seeds which often are known simply as "peas." To 10 ft.: lvs. of 3 lanceolate soft-hairy lfts. to 4 in. long: fls. yellow or orange, papilionaceous, in axillary racemes: pods to 3 in. long, hairy, constricted between the seeds, slender pointed.—Often grown as an ann. from seeds; in greenhouses propagated by cuttings. It thrives in S. Fla.

CAJEPUT-TREE: *Melaleuca Leucadendra.*

CAJOPHORA: *Caiophora.*

CALABASH GOURD: *Lagenaria.*

CALABASH-TREE: *Crescentia Cujete.*

CALABAZILLA: *Cucurbita fœtidissima.*

CALACINUM (*Muehlenbeckia*). Wire-Plants. *Polygonaceæ.* Prostrate, viney or climbing more or less polygonum-like woody plants with wire-like sts. and alternate lvs., small unisexual fls. in axillary clusters or short spikes or racemes, and berry-like frs.; grown in greenhouses and hanging-baskets and out-of-doors in warm climates. Propagated by cuttings, when seeds are not available.

axillare. Much branched prostrate or sprawling small bush forming matted clumps 1 ft. or less through, or at other times straggling: lvs. ⅓ in. or less long, oblong to nearly orbicular, rounded at base: fls. solitary or in 2's. New Zeal.—Cult. as *Muehlenbeckia nana.*

chilense. Twining: lvs. ovate to oblong, triangular at base, about ½ in. long: fls. in axillary and terminal racemes. Chile, Peru.

complexum. Wire-Vine. Maidenhair-Vine. Twining, covering bushes, rocks and chimneys with interlaced sts.: lvs. orbicular or fiddle-shaped, ½–¾ in. across: fls. in axillary or terminal spikes. New Zeal.—Much grown in Calif.

platycladum: *Homalocladium platycladum.*

CALADIUM. *Araceæ.* Trop. American herbs with tubers or rhizomes, usually peltate arrow-shaped lvs. mostly beautifully marked in many colors and patterns, and unisexual fls. on spadices slightly shorter than the spathes which have boat-shaped limbs; popular foliage plants in the S. and under glass in the N., often improperly called Colocasias.

Tubers may be planted in the open in well-worked soil to which bone-meal has been added. In the greenhouse tubers may be started in boxes of moss in a temperature varying from 70° to 85°; when roots are formed they should be put in pots and shifted as they grow. Propagation may also be effected by seeds.

argyrites: *C. Humboldtii.*

bicolor. Lvs. ovate, variously colored above, giving rise to many named forms, glaucescent beneath, the petioles 3–7 times longer than blades: spathes green, violet at throat, the limb tipped white. Trop. Amer.—The usual species in cult.

bulbosum: hort. name.

esculentum: *Colocasia esculenta.*

Humboldtii (*C. argyrites*). Lvs. ovate-oblong or oblong, green, spotted between veins with large transparent white markings, the petioles 2–3 times longer than blades. Brazil.

picturatum. Lvs. lanceolate, variously colored above, pale beneath, the petioles variegated below: spathes green, purplish inside, the limb white. Brazil, Peru.

CALAMINTHA: *Satureja.*

CALAMONDIN: *Citrus mitis;* see *Citrus Fruits* (page 155).

CALAMPELIS: *Eccremocarpus.*

CALAMUS. CANE and RATTAN PALMS. *Palmaceæ.* The largest genus of palms, with more than 200 species in trop. and subtrop. Asia and Afr. to the Philippines, New Guinea and Australia; some of them have been tried in S. Fla., but are not sufficiently hardy; Dæmonorops is a similar genus. The Calami are mostly climbing plants with hooks on the midrib or the upper pinnæ transformed into hooked spines or the rachis perhaps prolonged and whip-like and making very long reed-like sts.; feather-palms, polygamo-diœcious, with axillary branched spadices: fr. globose or ellipsoid, clothed with close scales. See *Palm.*

ciliaris. Very slender, covering a trellis or other support, climbing by means of long leafless branches with hooked spines: lf.-blade 1½–2½ ft. long, petiole very short, pinnæ 40–50 pairs and hairy: fr. globose, about ½ in. diam. Java, Sumatra.

Rotang. One of the species that yield rattan: very slender climber: lvs. 1½–2 ft. long, without whip-like prolongation; petiole very short; pinnæ very many and ½ in. or less broad, setose on ribs and margins: fr. subglobose, ½ in. diam. India.

CALANDRINIA. *Portulacaceæ.* Rather fleshy low herbs of the western side of the Americas, with narrow alternate or basal lvs., red or rose ephemeral fls. in racemes or panicles, and capsular frs.; suitable for borders or rock-gardens. Cult. as annuals and propagated by seeds or cuttings.

Burridgii. Ann. to 1 ft.: lvs. linear-lanceolate: fls. copper-rose or brick-red, small. S. Amer.

caulescens var. **Menziesii** (*C. Menziesii. C. speciosa*). RED MAIDS. Ann., diffuse or erect, sts. to 2 ft. long: lvs. oblanceolate to linear, to 2 in. long: fls. crimson or rose-red, about ½ in. long. W. N. Amer.

grandiflora. Per. to 3 ft.: lvs. oval, to 8 in. long: fls. light purple. Chile.

Menziesii: *C. caulescens* var.

speciosa: *C. caulescens* var. *Menziesii.*

umbellata. Per. to 6 in.: lvs. linear, basal: fls. bright crimson-magenta. Peru.

CALANTHE. *Orchidaceæ.* Terrestrial or epiphytic orchids, sometimes having pseudobulbs, with broad plaited lvs. and white, rose or yellow fls. on erect or nodding scapes, the sepals and petals similar, the lip with the claw united to the column, 3-lobed and usually spurred; they require hothouse conditions; mostly deciduous and require rest after fls. are past in winter. See *Orchids.*

bella (*C. Harrisii*). Hybrid between *C. Veitchii* and *C. Turneri* (the latter a form of *C. vestita* with crimson-blotched lip).

furcata (*C. veratrifolia*). Lvs. to 2 ft. long, oblong-lanceolate: fls. snow-white, to 2 in. across, in many-fld. racemes on scapes 3 ft. or more high, the lip 4-lobed and with slender spur, Apr.–May. Malaya, Australia.

Harrisii: *C. bella.*

Regnieri: *C. vestita* var.

Sanderiana. Lvs. elliptic-lanceolate, to 1 ft. long: fls. in many-fld. racemes, the sepals and petals pale lilac edged with purple, the lip dark purple with brown on spur. Trop. Afr.

Sandhurstiana: *C. Veitchii* var.

Veitchii. Hybrid between *C. rosea* and *C. vestita*, having rose-colored fls. with a white spot at base of lip. Var. **Sandhurstiana** (*C. Sandhurstiana*) has crimson fls.

veratrifolia: *C. furcata.*

vestita. Pseudobulbs 3 in. high; lvs. broad-lanceolate, to 1½ ft. long: fls. white or creamy, 2½ in. across, in 6–12-fld. racemes on scapes to 2½ ft. long, the 4-lobed lip marked with orange-yellow at base and with slender spur, Nov.-Dec. India, Malaya. Var. **Regnieri** has less deeply lobed rose-colored lip marked with purple in throat. Var. **Williamsii** has white sepals and petals bordered with rose and deep rose lip.

Williamsii: *C. vestita* var.

CALATHEA. *Marantaceæ.* Trop. American or African per. herbs with attractively colored basal tufted lvs. and fls. in heads or cones borne on scapes among the lvs.; commonly known as Marantas, but Maranta is a separate genus distinguished by technical characters. These plants, in both genera, are difficult to determine as to species without inflorescence, and foliage should be had from normally grown and developed subjects. Leaf-blades are intended in the subjoined dimensions of lvs.

Calatheas should be grown in a moist close greenhouse with a night temperature not below 65°. They require good drainage and loam soil mixed with leaf-mold and sand. They should be shaded from the direct rays of the sun. In subtropical climates calatheas may be grown out-of-doors with winter protection. Leaf colors are likely to differ between young and old plants. Propagated by dividing the crowns, by tubers or by cuttings in spring.

Allouia. To 4 ft., with edible tubers: lvs. to 24 in. long and 6 in. broad, light green above, silvery beneath. Trop. Amer.—Tubers edible.

Bachemiana (*Maranta Kegeliana*). To 16 in.: lvs. to 10 in. long and 2½ in. wide, unequal-sided, silvery-green above with white lines along nerves, purplish or greenish beneath. Brazil.

bella. Stemless: lvs. to 6 in. long and 3 in. broad, whitish-green above, pale purple beneath. Habitat unknown.

bicolor: *Maranta bicolor.*

Chantrieri. To 7 ft.: lvs. to 1½ ft. long, rich dark green but in juvenile stages pale yellowish-green with dark green band around margins and midrib, purplish-red beneath. Brazil.

eximia. To 1½ ft.: lvs. to 15 in. long, striped above with olive-green and silver, wine-red and pubescent beneath. Cent. Amer.

fasciata. To 1 ft.: lvs. to 9 in. long and 7 in. broad, dark olive-green above transversely barred with silvery-white, dull grayish-green below. Brazil.

Gouletii: *C. Vandenheckei.*

illustris. To 9 in.: lvs. to 6 in. long and 5 in. wide, shining olive-green with metallic luster above having white marginal zone, dull red beneath. Ecuador.

imperialis: a variant of *C. ornata.*

insignis. To 6 ft.: lvs. to 1½ ft. long and 8 in. broad, pale yellowish-green above margined and blotched with olive-green, dark maroon-red beneath. Brazil.

Legrelliana. To 1 ft.: lvs to 8 in. long and 3½ in. wide, shining green above with broad white central band and white transverse lines, whitish-green marked with red and green beneath. Colombia, Ecuador.

leopardina. To 1½ ft.: lvs. to 8 in. long and 3½ in. broad, rich green but in juvenile stage dark olive-green in center surrounded by band of paler green. Brazil.

Lietzei (*Maranta conspicua*). To 2 ft.: lvs. to 9 in. long and 2½ in. broad, velvety green above striped between side veins with olive-green and splashed with yellowish-green, purplish-red underneath. Brazil.

Lindeniana (*Maranta Lindeni*). To 3 ft.: lvs. to 1 ft. long, dark green above with olive-green zone either side the midrib and then darker zone, purplish zone beneath. Brazil.—Probably *Phrynium Lindeni*, Hort. belongs here.

Louisæ. To 3 ft.; lvs. to 1 ft. long, light green above feathered with white along midrib, tinted with purple-red below. Habitat unknown.

Luciana. To 3 ft.: lvs. to 1 ft. long, light green above with zone of greenish-white near margin and feathered along midrib, grayish-green beneath. Trop. Amer.

Makoyana. To 4 ft.: lvs. olive-green or cream-colored beneath blotched with dark green, red beneath. Brazil.

medio-picta. To 20 in.: lvs. to 8 in. long and 3½ in. wide, dark green above feathered with white along the midrib, pale green beneath. Brazil.

micans. To 8 in.: lvs. to 4 in. long and 1 in. broad, shining green above feathered with white, pale green beneath. Brazil.

musaica. Dwarf: lvs. cordate-ovate, to 6 in. long, pale shining green above transversely lined with lighter green. Brazil.

Oppenheimiana: *Ctenanthe Oppenheimiana.*

ornata. To 3 ft.: lvs. to 3 ft. long, rich green above, dull purple-red beneath, in juvenile forms often striped with pink and white. Guiana, Colombia, Ecuador.

Pavonii (*C. tubispatha*). To 2 ft.: lvs. to 10 in. long and 5½ in. wide, bright green above spotted with light green and brown. Peru.—The plant cult. as *Maranta tubispatha* may be a form of *M. bicolor.*

princeps. Lvs. to 10 in. long and 3½ in. wide, light green above with broad central band of black-green, violet-purple below. Amazon.

pulchella. Lvs. to 4 in. long and 2 in. wide, light green with transverse green bands, purple beneath. Brazil.

roseo-picta. To 8 in.: lvs. to 9 in. long and 6 in. broad, dark green above with red midrib and zone of bright red near margin, purple beneath. Brazil.

Sanderiana: a variant of *C. ornata.*

smaragdina: *Monotagma smaragdinum.*

splendida. To 1½ ft.: lvs. to 14 in. long and 10 in. wide, shining dark green above transversely barred with pale green, purple beneath. Brazil.

tubispatha: *C. Pavonii.*

undulata. To 8 in.: lvs. to 4 in. long and 2 in. broad, wavy, shining dark green above with a central white stripe, purplish beneath. Peru.

Vandenheckei (*C.* and *Maranta Gouletii*). To 2½ ft.: lvs. to 9 in. long, dark green above marbled with silvery-white along midrib and band along margin, purplish-red beneath. Brazil.

Veitchiana. To 4 ft.: lvs. to 1 ft. long and 6 in. wide, shining dark green above with irregular pale green band on either side midrib having brownish blotches, reddish underneath. Peru.

vittata. To 3 ft.: lvs. to 1½ ft. long and 9 in. broad, light green above transversely striped with white, tinted yellowish-green beneath. Colombia.

Wallisi. To 4 ft.: lvs. to 1 ft. long, light green above with a row of olive-green blotches on either side midrib, grayish-green beneath. Peru.

Warscewiczii. To 3 ft.: lvs. 1 ft. long and 5 in. broad, velvety green above and midrib feathered with yellow-green, purple beneath. Costa Rica.

zebrina. ZEBRA PLANT. To 3 ft.: lvs. to 2 ft. long and 1 ft. across, velvety green above with transverse bands of pale yellow-green and olive-green, purplish-red beneath. Brazil. Var. **Binotii** is a large form with darker colored lvs.

CALCEOLARIA (*Fagelia*). SLIPPERWORT. *Scrophulariaceæ.* Herbaceous and shrubby plants cult. in greenhouses in the N. and in the open in warm regions, having irregular cymes of showy saccate fls., the upper part of the fl. small and more or less pouched, the lower lip, in the cult. forms, very large and inflated and somewhat slipper-like, usually yellow, sometimes purple, often spotted; mostly native from Mex. to Chile.

The herbaceous calceolarias are grown from seed sown from late spring to early autumn for plants for the next winter and spring. Finely sifted soil should be provided, preferably one containing leaf-mold, and care should be exercised in watering as the seed is very small; sub-irrigation is the best method. A temperature of 60° is recommended and no direct sun till the plants are quite large.

The shrubby types are grown from seed or from cuttings. The latter are usually taken when the plants are trimmed in late summer or early autumn, choosing firm wood and cutting down to two joints, giving a temperature of 45–50° and protection from the sun.

alba. Shrubby, to 2 ft.: lvs. linear, to 2 in. long, remotely toothed: fls. white, ½ in. long and ⅓ in. across. Chile.

angustifolia: *C. integrifolia* var.

chelidonioides. Ann. to 3 ft.: lvs. to 8 in. long, pinnate into toothed segms.: fls. yellow, ½ in. long and 2 in. wide. Ecuador, Peru, Chile.

Clibranii: *C. profusa.*

crenatiflora. Per. to 2½ ft., pubescent: lvs. ovate, to 8 in. long, coarsely toothed: fls. drooping, to 1 in. long and broad, yellow with orange-brown spots on the inflated wavy lower lip. Chile.—Much grown by florists in many colors and large fls.

fruticohybrida. A group of shrubby cultigens with yellow, orange or dull red spotted fls.; to be considered as forms of *C. integrifolia.*

gracilis. Ann. to 1½ ft., sticky-pubescent: lvs. pinnate, the lobes toothed, white beneath: fls. pale yellow, ½ in. long and ¼ in. wide. Peru, Ecuador.

herbacea: see *C. herbeohybrida.*

herbeohybrida (*C. herbacea. C. hybrida. C. Youngii*). A group of herbaceous cultigens, usually dwarf or small, 2 ft. or less, with inflated pouches, in many colors; to be regarded as forms of *C. crenatiflora.*

hybrida: see *C. herbeohybrida.*

integrifolia (*C. rugosa*). Sts. woody, to 6 ft.: lvs. oblong or oval, to 3 in. long, rugose, toothed: fls. ½ in. across, yellow to red-brown, not spotted. Chile.—Much used by gardeners. Var. **angustifolia** (*C. angustifolia*) has lanceolate lvs. Var. **viscosissima** (*C. viscosissima*) is a sticky-hairy form.

Lymani: a hort. shrubby form with bronzy-red fls.

Medfordi: a hort. form with velvety-maroon fls.

mexicana. Ann. to 1 ft., glandular-hairy: lower lvs. 3-parted or -lobed, the upper pinnate into ovate toothed segms., to 2½ in. long: fls. pale yellow, ½ in. long and ¼ in. wide. Mex., Cent. Amer.

pinnata. Ann. to 3 ft., pubescent: lvs. pinnate, to 3 in. long: fls. pale yellow, ½ in. long and broad. Chile, Peru, Bolivia.

polyrrhiza. Dwarf tufted per. to 2 in.: lvs. lanceolate, to 2½ in. long: fls. yellow spotted purple, 1 in. long and ½ in. wide, solitary on scapes to 4 in. long. Chile.

profusa (*C. Clibranii*). A garden form, to 3 ft., very free-flowering: fls. light and graceful, rich golden-yellow.

rugosa: *C. integrifolia.*

scabiosæfolia. Pubescent ann. to 2 ft.: lvs. pinnate, to 8 in. long, the bases of the petioles united across the sts., lfts. toothed or cut: fls. pale yellow, ½ in. long and ⅓ in. across. Ecuador to Chile.

Stewarti: a hort. shrubby form with yellow fls.

umbellata. Cespitose herb, mostly with very short st.: lvs. all nearly or quite radical, oblong, lanceolate, or somewhat ovate, obtuse, entire, slightly hairy underneath: fls. yellow, 2–8 terminating a scape-like peduncle, the lip ½ in. or less across. Bolivia.

Veitchii. Hybrid with *C. alba* as one parent, to 5 ft.: fls. rather small, pale lemon-yellow.

violacea: *Jovellana violacea.*

viscosissima: *C. integrifolia* var.

Youngii: see *C. herbeohybrida.*

CALENDULA. *Compositæ.* Herbaceous annuals and perennials with simple alternate lvs. and usually large yellow or orange heads of ray- and disk-fls.; pappus none: fr. large, flattened or curved. Native from Canary Isls. to Persia, one a garden favorite.

Calendulas are of easy culture in the greenhouse as well as in the garden, growing quickly from seeds. Also propagated by cuttings, of special colors.

eriocarpa. Branching ann.: lvs. lanceolate, partly clasping, nearly glabrous: heads yellow, about 1 in. across. Country unknown.

hybrida: *Dimorphotheca hybrida.*

maderensis. Per. to 2 ft.: lvs. oblong-spatulate, attenuate at base, rough, nearly entire: heads yellow. Madeira.

maritima. Ann., sticky-pubescent: lvs. obovate to lanceolate, entire, the upper partly clasping: heads yellow, about 1½ in. across. Sicily.—Probably only a race of *C. officinalis.*

officinalis. Pot-Marigold. Hardy branching ann. to 2 ft., hairy: lvs. thickish, oblong to oblong-ovate, entire or minutely toothed, partly clasping: heads to 4 in. across, rays white-yellow to deep orange, closing at night, blooming for the entire season; sometimes proliferous from the involucre. S. Eu.—A favorite flower-garden plant and grown for cut-flowers in winter.

pluvialis: *Dimorphotheca annua.*

Pongei: *Dimorphotheca annua* var. *ligulosa.*

sicula. Probably only a race of *C. officinalis* distinguished by being almost glabrous and heads only about 1 in. across. S. Italy.

stellata. Ann. to 1 ft., rough: lvs. ovate-oblong, the upper partly clasping, wavy-toothed: heads yellow, 1–2 in. across. Medit. region.

suffruticosa. Ann., woody at base, pubescent: lvs. lanceolate, somewhat toothed: heads bright yellow, very numerous, about 1 in. across. Medit. region.

Tragus: *Dimorphotheca aurantiaca.*

CALICO-BUSH: *Kalmia latifolia.*

CALICO-FLOWER: *Aristolochia elegans.*

CALIMERIS. *Compositæ.* Hardy per. aster-like herbs, differing from Aster in the character of the involucre; native in Asia. One is cult. in the border and requires the same treatment as the perennial asters.

incisa (*C. incisæfolia. Aster incisus*). To 2 ft.: lvs. oblong-lanceolate, cut-toothed, the upper narrower and entire: heads solitary, 1 in. across, rays purple or almost white, disk yellow. Siberia. Var. **rosea** has pink fls.

CALLA. *Araceæ.* One herb growing in bogs in the north temp. zone, sometimes transplanted to pond-margins and wet places. The callas of gardens belong to the genus Zantedeschia. C. palustris. Water-Arum. Wild Calla. Lvs. ovate-cordate, to 6 in. long and broad, the petioles to 10 in. long: spathes green outside, white inside, about 2 in. long and 1½ in. wide; berries red, in dense cluster.

CALLA, BLACK: *Arum palæstinum.* **Red**: *Sauromatum guttatum.*

CALLIANDRA (*Anneslia*). *Leguminosæ.* Trop. shrubs and trees with 2-pinnate lvs., fls. in heads or clusters having long conspicuous stamens, and flat pods with thickened margins; grown out-of-doors in trop. and subtrop. regions and in greenhouses N. Propagated by cuttings over bottom heat, when seeds are not available.

californica. To 4 ft.: weak slender spines at base of petioles: lfts. ¼ in. long: fls. purple with long purple stamens. Lower Calif.

Guildingii. Small tree: lfts. to 2½ in. long: fls. greenish-white with crimson stamens to 3 in. long. Trinidad.

Houstoniana. To 20 ft.: lfts. to ¼ in. long: fls. brown-tomentose with long purple stamens, the heads in terminal racemes. Mex., Cent. Amer.

portoricensis. To 25 ft.: lfts. ⅗ in. long: fls. white with long white stamens. W. Indies.

Tweedii (*Inga pulcherrima*). To 6 ft.: lfts. linear: fls. purple with long purple stamens. Brazil.

CALLICARPA. Beauty-Berry. *Verbenaceæ.* Shrubs and trees with opposite simple lvs., small pink, bluish or white fls. in axillary clusters, and attractive berry-like frs.

Callicarpas can be grown in a light airy place in the greenhouse in a compost of loam and peat. Propagated by cuttings, layers and seeds. They are raised for both the ornamental flowers and colored fruits in clusters. Some of them are fairly hardy in the North and if the tops kill, new shoots usually bloom and fruit.

americana. French-Mulberry. Shrub to 6 ft.: lvs. to 6 in. long, toothed, white- or rusty-tomentose beneath: fls. bluish, May–July: fr. violet or white in var. **alba.** Va. to Tex., W. Indies; not hardy N.

cana (*C. sinensis*). To 12 ft.: lvs. to 6 in. long, toothed, gray- or white-pubescent beneath: fls. lavender: fr. lavender. Malaya.

dichotoma (*C. purpurea*). Shrub to 4 ft.: lvs. to 3 in. long, toothed above middle: fls. pink, Aug.: fr. lilac-violet. Japan, China; stands well N.

Giraldiana. To 10 ft.: lvs. to 4 in. long, toothed, pubescent beneath: fls. pink, July-Sept.: fr. violet. China; stands N.

japonica (*C. Mimurazaki*). Shrub to 5 ft.: lvs. to 5 in. long, finely-toothed: fls. pink or whitish, Aug.: fr. violet or white in var. **leucocarpa.** Japan; stands N.

longifolia. Shrub: lvs. to 5 in. long, lanceolate, pubescent beneath: fls. pink or purple: fr. white. Himalayas, China.

Mimurazaki: *C. japonica.*

purpurea: *C. dichotoma.*

sinensis: *C. cana.*

CALLICHROA: *Layia.*

CALLICOMA. *Cunoniaceæ.* A few small trees of Australia having opposite leathery lvs. and small fls. in heads, without petals; one species planted in S. Calif.

serratifolia. To 40 ft.: lvs. oblong to ovate-lanceolate, to 4 in. long, coarsely toothed, shining above, tomentose beneath: heads globular, dense, stamens much exserted.

CALLIGLOSSA: *Layia Calliglossa.*

CALLIOPSIS: *Coreopsis.*

CALLIPRORA: *Brodiæa ixioides.*

CALLIRHOË. Poppy-Mallow. *Malvaceæ.* N. American herbs, root often tuberous, with alternate lobed or dissected lvs. (as if compound) and showy pink or red-purple fls.; some of them are attractive flower-garden subjects.

Seeds should be sown where the plants are to stand. Perennial kinds may also be propagated by cuttings and division of the roots.

digitata. Per. to 1½ ft.: lvs. deeply parted into linear lobes or sometimes entire: fls. reddish-purple to violet, to 2 in. across, with small calyx. Mo. to Tex.

involucrata (*C. verticillata*). Per. to 1 ft.: lvs. deeply 5–7-parted: fls. red-purple or paler, to 2½ in. across, with leafy calyx. Minn. to Tex.

Papaver. Per., main st. 1 ft. or more, peduncle-like branches 8–12 in. long and solitary or somewhat clustered: lvs. 3–5-parted into narrow divisions: fls. rose or purple, 2 in. across. Ga., Fla. to Tex.

pedata. Ann. to 3 ft.: lower lvs. 5–7-lobed, the upper ones 3–5-parted: fls. red-purple to lilac, 1 in. long, with small calyx. Mo. to Tex.

verticillata: *C. involucrata.*

CALLISTACHYS: *Oxylobium.*

CALLISTEMMA: *Callistephus.*

CALLISTEMON. Bottle-Brush. *Myrtaceæ.* Australian shrubs or small trees with scattered linear or lanceolate entire simple leathery lvs., showy yellow or red fls. in dense spikes resembling a bottle-brush due to the long exserted stamens (which are not united with each other) and capsular frs.; suitable for cult. in warm-temp. regions, particularly in Calif.

They are not particular as to soil. Propagated by seeds or cuttings of ripened wood. Seeds are gathered in summer by allowing the capsules to open in boxes or sheets of paper and are sown the next spring.

brachyandrus. Shrub: lvs. stiff and needle-like, to 1½ in. long: fls. with dark red stamens and yellow anthers, in spikes to 3 in. long.

citrinus: *C. lanceolatus.*

coccineus. To 30 ft.: lvs. lanceolate, to 1½ in. long: fls. with red stamens and yellow anthers, the spikes not very dense.

Cunninghami. Branches yellowish: lvs. elliptic, pale, reddish when young.

hybridus: a name of uncertain application.

lanceolatus (*C. citrinus. Metrosideros floribunda. M. semperflorens. M. citrina*). To 30 ft.: lvs. lanceolate, to 3 in. long: fls. with bright red stamens, the spikes not very dense.

linearis. Lvs. narrowly linear, to 5 in. long: fls. with red stamens, the spikes dense.

paludosus: *C. salignus* var. *australis.*

phœniceus. Lvs. narrowly lanceolate, to 4 in. long: fls. with rich red stamens, the spikes not dense.

pinifolius. Tall shrub: lvs. stiff and terete, linear, to 4 in. long: fls. with yellowish-green stamens.

rugulosus: name of uncertain application.

rigidus. Lvs. linear or narrowly lanceolate, to 5 in. long: fls. with red stamens, the spikes very dense.

salignus. To 40 ft.: lvs. lanceolate, to 3 in. long: fls. with yellow or light pink stamens, the spikes not very dense. Var. **australis** (*C. paludosus*) has lvs. to 2 in. long. Var. **viridiflorus** has greenish-yellow stamens and shorter lvs.

speciosus. To 40 ft.: lvs. lanceolate, to 4 in. long: fls. with rich red stamens and yellow anthers, the spikes very dense.

CALLISTEPHUS. China Aster. *Compositæ.* Erect branching plants with herbage of strong odor, large terminal heads bearing prominent rays; pappus of bristles. A single species from Asia which has resulted in many races of well-known and adaptable garden annuals. Grown from seed; for early bloom the seed is sown indoors in late spring, but the main crop may be sown directly in the open. The distance at which the plants are to stand is governed by the stature of the particular variety, ranging from 6 in. to 2 ft. **C. chinensis.** Erect, hairy, to 2½ ft.: lvs. alternate, ovate, deeply toothed or lobed: heads terminal, in the wild plant with 1–2 series of ray-fls. and yellow disk-fls., but under cult. the rays are numerous and vary in color from violet, purple, blue, rose to white but no true yellow, and 5 in. and more across; there are dwarf and condensed forms. China, Japan. —Known also as *Callistemma chinense* and *hortense.*

CALLITRIS. Cypress-Pine. *Pinaceæ.* Evergreen trees with scale-like lvs. and jointed mostly angled branchlets, staminate fls. in ovoid or cylindrical catkins and cones usually of 6 unequal scales; native in Australia and New Caledonia. Grown in warm regions, as Fla. and Calif.; for cult. see *Conifers.* The genus belongs in the cypress section of the Pine family.

Actinostrobus: *Actinostrobus pyramidalis.*

arborea: *Widdringtonia juniperoides.*

australis: *C. oblonga.*

calcarata. Tree to 60 ft. and more: cones ovoid, ½ in. across. Australia.

cupressiformis (*C. rhomboidea*). Tree to 50 ft.: cones nearly globose, ½ in. across, often clustered. Australia.

Drummondii. Shrub or small tree: cones globose, ½ in. across. Australia.

glauca: *C. robusta.*

Muelleri. Tree to 30 ft.: cones globular, to 1 in. across. Australia.

oblonga (*C. australis*). Tree to 25 ft.: cones ovoid or oblong, to 1 in. long, usually clustered. Tasmania.

quadrivalvis: *Tetraclinis articulata.*

rhomboidea: *C. cupressiformis.*

robusta (*C. glauca. C. verrucosa*). Tree to 100 ft.: cones subglobose, ¾ to 1 in. or more across. Australia.

verrucosa: *C. robusta.*

Whytei: *Widdringtonia Whytei.*

CALLUNA. Heather. *Ericaceæ.* One hardy evergreen shrub native in Eu. and Asia Minor (also in a few localities in E. N. Amer., but probably intro.), cult as for Erica and differing in having a colored calyx longer than the corolla. **C. vulgaris** (*Erica vulgaris*). To 3 ft.: lvs. scale-like and overlapping: fls. natively mostly purplish, ⅛ in. long, in racemes to 10 in. long, blooming profusely in late summer. There are numerous hort. vars., as: **alba**, fls. white and its forms *elata, minor, pilosa, pumila, tenella;* **Alportii**, tall and vigorous, fls. carmine; **argentea**, lvs. pale; **aurea**, dwarf, lvs. golden; **carnea**, fls. pink; **coccinea** (var. *rubra*), fls. deep red; **compacta**, of compact habit; **cuprea**, lvs. golden turning bronze; **Foxii**, dwarf and matted; **Hammondii**, fls. white; **hirsuta** (var. *tomentosa*), lvs. gray-tomentose; **humilis**, low, fls. white; **hypnoides**, to 1 ft., fls. deep pink; **monstrosa**; **nana** (var. *pygmæa*), to 4 in., fls. purple; **rosea**, fls. pink; **rubra**, fls. rosy-carmine; **Searlei**, fls. white, late; **sericea**, fls. white, late; **variegata**, lvs. somewhat variegated with white.

CALLUS: a hard prominence or protuberance; in a cutting or on a severed or injured part, the roll of new covering tissue.

CALOCARPUM: *Achras.*

CALOCEPHALUS. *Compositæ.* Australian ann. herbs or small shrubs with mostly alternate entire lvs. and fl.-heads in terminal clusters, fls. all tubular; pappus of scales or plumose bristles. One species is grown in Calif. as a foliage edging. Propagated by cuttings.

Brownii (*Leucophyta Brownii*). To 1 ft., white-woolly: lvs. linear, ⅙ in. long: heads ½ in. across, subtended by a few floral lvs.

CALOCHORTUS. Mariposa-Lily. Globe-Tulip. *Liliaceæ.* Cormous herbs native in W. N. Amer., with linear-lanceolate lvs. borne on the st. and broadly campanulate yellow, white or lilac interesting fls. solitary or in terminal clusters, blooming in spring and summer, mostly showy.

Calochortuses should have a light porous soil, not too stimulating, with perfect drainage, such as equal parts of light loam and spent tan-bark, with a little broken charcoal. They withstand much cold but not alternate thawing and freezing. Winter protection of leaves should be provided. Planting should be late in autumn and bulbs lifted after ripening the following season. They are useful in borders and frames and are sometimes bloomed indoors. Propagated by natural increase and by seeds when obtainable.

albus. To 2 ft.: fls. white, purplish at base, 1¼ in. long, nodding. Calif. Var. **rubellus** has fls. tinged with rose.

amabilis. Golden G. To 1½ ft.: fls. golden-yellow, 1¼ in. long, nodding. Calif.

amœnus. Purple G. To 1½ ft.: fls. rose-purple, 1¼ in. long, nodding. Calif.

Benthami: *C. monophyllus.*

cæruleus. Cats-Ear. To 6 in.: fls. blue, ½ in. long, hairy, erect. Calif.

catalinæ. To 2½ ft.: fls. white to lilac-purple, maroon at base, 2 in. long. S. Calif., Catalina Isl.

citrinus: *C. luteus* var.

clavatus. To 3 ft.: fls. rich yellow lined with brown, having club-shaped hairs at base, 2 in. long. Calif.

flavus (*Cyclobothra flava*). To 2 ft.: fls. yellow, ¾ in. long. Mex.

flexuosus. Sts. decumbent or ascending and flexuose: fls. purple or white with yellowish base, 1 in. long. Nev., Utah, Ariz.

Greenei. To 1½ ft.: fls. lilac marked below with yellow, to 1½ in. long. Calif.

Gunnisoni. To 1½ ft.: fls. white streaked with purple, 1¾ in. long. S. D. to New Mex.

Howellii. To 1½ ft.: fls. white, 1 in. long. Ore.

Kennedyi. To 6 or rarely 14 in. high: fls. orange-red or vermillion, to 1½ in. long. Calif., Nev., Ariz.

Leichtlinii. To 1 ft.: fls. white tinged with purple, yellow at base with dark spot, 1¼ in. long. Ore. to S. D. and Calif.

lilacinus: *C. uniflorus.*

luteus. To 2 ft.: fls. yellow or orange lined with brown, to 2 in. long. Calif. Var. **citrinus** has lemon-yellow petals with dark brown spot near base. Var. **oculatus** has white or lilac petals, the brown spot bordered with yellow. Var. **Vestæ** has pure white fls. with brown spot.

macrocarpus. Green-banded M. To 2 ft.: fls. purple with green band down middle, 2 in. long. B. C. to Calif.

Maweanus. To 8 in.: fls. white or tinged with purple, 1 in. long. Ore. to Calif. Var. **major** is a larger form and var. **roseus** has fls. tinged with rose.

monophyllus (*C. Benthami*). Yellow Star-Tulip. To 10 in.: fls. yellow with brown at base, ¾ in. long. Calif.

nitidus. To 1½ ft.: fls. lilac or purple with dark purple spot, 1½ in. long. Wash., Mont., Ore.

Nuttallii. Sego-Lily. To 1½ ft.: fls. white lined with purple, with purple spot at base, to 1¾ in. long. Wash. to Calif. and New Mex.

Plummeræ. To 2 ft.: fls. purple with orange-colored hairs, 1½ in. long. Calif.

pulchellus. To 2 ft.: fls. golden-yellow, ciliate on margin, 1¼ in. long, nodding. Calif.

Purdyi. To 1 ft.: fls. creamy-white tinged with purple, hairy, ¾ in. long. Wash., Ore.

splendens. Lilac M. To 2 ft.: fls. lilac, 2 in. long. Calif. Var. **rubra** has reddish-lilac fls.

uniflorus (*C. lilacinus*). To 10 in.: fls. lilac, 1 in. long. Calif.

venustus. White M. To 10 in. or more: fls. pale lilac with reddish-brown spot, 2 in. long. Calif. Var. **purpurascens** has darker fls. and var. **roseus** a rose-colored spot at apex. Var. **superbus** is an improved form.

Weedii. To 2½ ft.: fls. yellow dotted with orange-brown, 1¼ in. long. Calif.

CALODENDRUM. *Rutaceæ.* One S. African evergreen tree adapted to cult. in warm regions (as S. Fla.), for interest and beauty, for its dark green foliage and profusion of showy bloom. **C. capensis.** Cape-Chestnut. To 70 ft.: lvs. simple, ovate, the veins parallel, to 5 in. long: fls. 1½ in. long, light rose-lilac with purple dots, in large terminal panicles: frs. nearly spherical, woody, covered with tubercles.—Propagated by cuttings of young wood over heat.

CALONYCTION. Moonflower. *Convolvulaceæ.* Trop. American twining herbs with heart-shaped to arrow-shaped lvs., large fragrant white or purple fls. blooming at night, having long tube, flat limb and exserted stamens and style; grown rarely as a greenhouse vine in the N. and out-of-doors in the S. Propagated by seeds, which are often notched to hasten germination. Per., but often grown as ann.

aculeatum (*Ipomœa Bona-Nox. I. noctiflora. I. mexicana grandiflora*). Juice milky: sts. more or less prickly: lvs. broad-ovate, to 8 in. long, sometimes 3-lobed: fls. white, often banded with green, with tube to 6 in. long and limb 6 in. across. Tropics, Fla.—The common moonflower.

muricatum. Similar to *C. aculeatum* but with smaller purple fls. to 3 in. across. Tropics.

Tuba (*Ipomœa Tuba*). Differs from *C. aculeatum* in thick cordate ovate not lobed lvs. and very broad obtuse rather than narrow-acuminate calyx-lobes: fls. white, 5 or 6 in. long. S. Fla., W. Indies.

CALOPHACA. *Leguminosæ.* Low shrubs or herbs with alternate pinnate lvs., yellow or violet papilionaceous fls. in racemes or solitary, and cylindrical pods. Grown in borders or on rocky slopes in well-drained soil. Propagated by seeds and sometimes grafted high on Laburnum.

wolgarica. To 3 ft.: lfts. ½ in. long: fls. bright yellow, 1 in. long, in racemes: pods to 1¼ in. long. S. Russia, Turkestan.

CALOPHANES: *Dyschoriste.*

CALOPHYLLUM. *Guttiferæ.* Trees of trop. Asia and Amer., with opposite leathery lvs. which have numerous parallel cross veins, polygamous fls. in racemes or panicles, and fr. a drupe. Several species yield oil and gum; sometimes planted for ornament in tropics.

antillanum (*C. Calaba* of some authors). Maria. To 90 ft. or more: lvs. to 6 in. long: fls. white, fragrant, in axillary few-fld. racemes: fr. about 1 in. across. W. Indies.

Calaba: *C. antillanum.*

CALOPOGON. *Orchidaceæ.* N. American terrestrial orchids with grass-like lvs. and fls. borne in racemes on naked scapes, the sepals and petals similar, the lip long-clawed and hairy above; sometimes planted in bog- or rock-gardens.

pulchellus (*C. tuberosus. Limodorum tuberosum*). Grass-Pink Orchid. To 14 in.: lvs. linear, to 8 in. long: fls. violet-rose, 1½ in. across, in 2–5-fld. racemes, the lip bearded with golden-yellow hairs, June–Aug. Swamps, E. N. Amer.

tuberosus: *C. pulchellus.*

CALOTHAMNUS. *Myrtaceæ.* Australian shrubs with narrow scattered lvs., usually showy red fls. in clusters or spikes, the stamens long-exserted and united into bundles, and capsular fr. For cult. see *Callistemon.*

coccineus: a hort. name for *C. quadrifidus.*

homalophyllus. To 6 ft.: lvs. oblong to nearly linear, very obtuse, 1–2 in. long: fls. rich crimson, to 1 in. long, in spikes.

longissimus. Low shrub: lvs. terete, 6 in. to 1 ft. or more long: fls. 1 in. long, in few-fld. spikes.

quadrifidus. To 8 ft.: lvs. needle-like, to 1 in. long: fls. rich crimson, to 1 in. long, in clusters.

sanguineus. Tall shrub: lvs. terete, to 1½ in. long: fls. rich red, 1 in. long, in clusters or short spikes.

CALPIDISCA: see *Utricularia.*

CALPURNIA. *Leguminosæ.* Trees or shrubs with pinnate lvs., yellow papilionaceous fls. in racemes, and rather flat slightly winged pods; native in Afr. Grown out-of-doors in subtrop. climates, and sometimes in greenhouses, for ornament; propagated by cuttings under glass or by seeds.

aurea (*C. lasiogyne*). To 15 ft.: lfts. oval, to 1¾ in. long: fls. about ½ in. long: pods linear, to 3 in. long. S. Afr.

lasiogyne: *C. aurea.*

CALTHA. *Ranunculaceæ.* Per. small herbs growing in marshes in the north temp. zone, having simple usually heart-shaped lvs. and yellow, white or pink fls. without petals but with petal-like sepals; grown in moist and boggy situations. Propagated by division of roots in autumn and by seed.

leptosepala (*C. rotundifolia*). To 1 ft.: lvs. oval, to 4 in. long: fls. white tinged blue outside, about 1 in. across, solitary, June–Aug. Alaska to New Mex.

palustris (*C. parnassifolia*). Marsh-Marigold. To 2 ft.: lvs. cordate, to 7 in. wide: fls. bright yellow, to 2 in. across, several together, Apr.–June, making masses of yellow. Newf. to S. C. and Neb.—The young lvs. are eaten as greens under the name "cowslip." Var. **monstrosa-pleno** (var. *flore-pleno*) has large double fls.

parnassifolia: *C. palustris.*

polypetala. To 2 ft.: lvs. to 1 ft. across: fls. golden-yellow, to 3 in. across, in spring. Caucasus, W. Asia.

rotundifolia: *C. leptosepala.*

CALTROP FAMILY: *Zygophyllaceæ.*

CALYCANTHACEÆ. Calycanthus Family. Two or three genera of deciduous shrubs having aromatic bark, opposite entire lvs., bisexual solitary fls. with many similar sepals and petals, many stamens, and fr. of many 1-seeded achenes inclosed in the receptacle; native in N. Amer. and E. Asia. Calycanthus and Meratia are cult.

CALYCANTHUS (*Butneria*). Sweet-scented Shrub. Sweet-Shrub. *Calycanthaceæ.* Deciduous N. American shrubs with large fragrant brownish fls. borne at the tips of short branchlets; hardy in the N. except *C. occidentalis.* They do best in rich well-drained soil. Propagated by seeds, layers, suckers, and division.

elongatus: *C. fertilis* var. *ferax.*

fertilis (*C. glaucus*). To 10 ft.: lvs. ovate to oblong, to 6 in. long, glaucous and nearly glabrous beneath: fls. reddish-brown, to 2 in. across: fr. contracted at mouth. Pa. to Ga. and Ala. Var. **ferax** (*C. lævigatus, C. elongatus*) has lvs. green beneath.

floridus. Carolina Allspice. To 10 ft.: lvs. ovate or elliptic, to 5 in. long, densely pubescent and pale beneath: fls. dark reddish-brown, 2 in. across: fr. contracted at mouth. Va. to Fla. Var. **ovatus**, lvs. ovate.

glaucus: *C. fertilis.*

lævigatus: *C. fertilis* var. *ferax.*

macrophyllus: *C. occidentalis.*

occidentalis (*C. macrophyllus*). To 12 ft.: lvs. ovate to oblong-lanceolate, to 8 in. long, green and nearly glabrous beneath: fls. light brown, to 3 in. across: fr. not contracted at mouth. Calif.

præcox: *Meratia præcox.*

CALYCOTOME. *Leguminosæ.* Spiny deciduous shrubs with lvs. of 3 lfts., yellow papilionaceous fls. solitary or in clusters, and linear-oblong pods with thickened or winged margin; native in the Medit. region. Sometimes grown in mild climates for ornament. Cult. as for Cytisus.

spinosa. To 5 ft.: lfts. ½ in. long: fls. in clusters of 1–4, ½ in. long: pods about 1 in. long. S. Eu.

CALYPSO (*Cytherea*). *Orchidaceæ.* One terrestrial orchid native in cool bogs in N. Amer. and Eu., and sometimes planted in similar places. **C. bulbosa** (*C. borealis*). To 6 in., with small bulbs: lf. solitary, round-ovate, to 1½ in. long: fls. solitary, variegated purple, pink and yellow, with large saccate lip.

CALYSTEGIA PUBESCENS: *Convolvulus japonicus.*

CALYTRIX. *Myrtaceæ.* Heath-like Australian shrubs with small scattered entire lvs. and yellow, pink, lilac or white fls., stamens commonly numerous; one species intro. in Calif.

Sullivani. Shrub, glabrous or nearly so: lvs. linear-3-angled, to ¼ in. long: fls. probably white, in heads or short spikes terminal or lateral on branchlets; calyx-lobes awned.

CALYX: the outer circle of floral envelopes.

CAMAROTIS. *Orchidaceæ.* Epiphytes with short lvs. and fls. in erect or stiffly spreading racemes, the sepals and petals similar, the lip 3-lobed and spurred, the column with an upright beak; suitable for hothouse cult. See *Orchids.*

Mannii. Lvs. very thick, to 4 in. long and ⅔ in. wide: fls. ¼ in. across, of pale color, in short racemes. India.

purpurea: *C. rostrata.*

rostrata (*C. purpurea*). St., to 2½ ft. long: lvs. to 4 in. long and ½ in. across: fls. about ½ in. across, in 5–10-fld. spreading racemes about length of lvs., sepals and petals pale purple, lip somewhat saccate, bright rose, May–July. India.

CAMASSIA (*Quamasia*). CAMASS. *Liliaceæ.* N. American bulbous herbs with linear basal lvs. and blue or nearly white fls. in bracted racemes terminating scapes, the perianth-segms. distinct.

Camassias are hardy and do well in loamy soils. Bulbs should be planted 3–4 inches apart in early autumn and not disturbed; also propagated by seeds. Useful in borders.

Cusickii. To 3 ft.: fls. pale blue, ¾ in. long. Ore.

esculenta (*C. Fraseri. Q. hyacinthina*). To 2 ft.: fls. light blue or rarely white, ½ in. long. Pa. to Ga. and Tex.

Fraseri: *C. esculenta.*

hyacinthina: *C. esculenta.*

Leichtlinii. To 2 ft.: fls. dark blue to creamy-white, 1 in. long. B. C. to Calif. Var. **alba** has white fls.

Quamash (*C. esculenta* of some authors). To 3 ft.: fls. dark blue to nearly white, 1 in. long. B. C. to Calif.

CAMEL-HAY: *Cymbopogon Schœnanthus.* **-THORN**: *Acacia Giraffæ.*

CAMELLIA. *Theaceæ* or *Ternstrœmiaceæ.* Evergreen trees and shrubs native in Asia, having alternate simple toothed lvs., white, or red showy sessile fls. with deciduous sepals, and capsular frs.

Camellias are popular ornamentals for the greenhouse and for out-of-doors South, blooming in late winter and spring. They do not thrive in direct sunlight and when in bloom should be kept in a temperature of 50° or a little more. Propagated by cuttings in winter. The plants are sometimes included in Thea, but that genus has smaller pedicelled flowers with persistent sepals.

cuspidata: *Thea cuspidata.*

japonica (*Thea japonica*). COMMON C. To 40 ft.: lvs. to 4 in. long, dark green and shining above: fls. red varying to white and rose, to 5 in. across, often double. China, Japan.—Popular out-of-doors Ga. south. Hort. vars are: **alba-plena**, double white; **althææflora**; **Chandlerii**, dark red; **Donklaeri**, semi-double, crimson and white; **Mathotiana alba**, large white; **pæoniæflora**; **variegata**, crimson and white.

reticulata. Shrub: lvs. to 5 in. long, dull green: fls. purplish-rose, to 7 in. across, sometimes double. China.

Sasanqua (*Thea Sasanqua*). Shrub: lvs. to 2 in. long, dark green and shining above: fls. white, to 2 in. across, often double. China, Japan.

Thea: *Thea sinensis.*

CAMOENSIA. *Leguminosæ.* Trop. African woody climbers with digitately 3-parted lvs., papilionaceous fls., and flattened pods; one species planted in tropics and intro. in S. Calif., showy.

maxima. Lfts. obovate, to 6 in. long, shining: fls. white, to 4 in. across, petals frilled and edged with gold: pods to 8 in. long.

CAMPANULA. BELLFLOWER. *Campanulaceæ.* Mostly per. herbs (a few kinds ann. and others bien.) with alternate or radical lvs., 5-lobed bell-shaped or wheel-shaped attractive and mostly showy fls. with prevailing colors in shades of blue, and fr. an ovoid or top-shaped caps.; northern hemisphere.

Campanulas are popular for the flower-garden, rock-garden and borders, and *C. Rapunculus* is known as a vegetable, the roots and leaves being eaten as a salad. The perennial species are propagated by seeds under glass and transplanted to the open after danger of frost is over, and by cuttings and division; seeds are sometimes sown in summer to produce blooming plants the following season, and this is the procedure with the biennials as Canterbury bells. A covering of leaves is good winter protection in the North. The annuals are propagated by seed sown out-of-doors or under glass. In the following account, the species are perennial unless otherwise stated.

abietina. To 15 in., tufted: lvs. lanceolate or basal ones ovate, toothed: fls. light blue, in loose branching spikes. E. Eu.

acaulis: listed name, probably the short-stemmed large-fld. form of *C. glomerata.*

alliariæfolia. To 2 ft., pubescent: lvs. ovate-cordate, toothed, tomentose beneath, to 3 in. long, the basal long-stalked: fls. white, to 1¼ in. long, axillary, nodding, with appendage at base of each sinus of calyx. Caucasus, Asia Minor.

Allionii. To 5 in., with creeping underground rootstocks: lvs. linear-lanceolate, to 2 in. long: fls. purple, 1½ in. long and broad, nodding, solitary. W. Alps.

amabilis: *C. phyctidocalyx.*

ardonensis. Small and slender, with grass-like foliage, cespitose: lvs. linear or filiform, sparsely serrate: fls. deep blue, solitary on st. scarcely surpassing radical lvs. Caucasus.

arvatica: *Wahlenbergia hederacea.*

asiatica: garden name of an erect white-fld. plant.

attica: *C. drabifolia.*

Aucheri. Dwarf, cespitose, the sts. 1-fld.: lvs. pubescent, oblong or ovate-spatulate, crenate, those on st. becoming linear: fls. violet, pubescent outside. Caucasus, alpine.

barbata. To 9 in.: lvs. mostly basal, lanceolate, to 6 in. long, hairy: fls. pale blue, 1 in. long, nodding, in loose racemes, with bearded throat. Alps. Var. **alba** has white fls.

Bellardi: a synonym of *C. cæspitosa.*

bellidifolia. To 3 in., tufted: lvs. ovate, coarsely toothed, the basal long-stalked: fls. violet, solitary. Caucasus.

betonicæfolia. To 2½ ft., hairy: lvs. oblong or ovate, coarsely toothed: fls. purplish-blue, pale yellow at base, ¾ in. long, solitary or few. Asia Minor.

bononiensis. To 2½ ft., rough: lvs. ovate, to 3 in. or more long, the basal long-stalked, pale beneath: fls. purplish, ¾ in. long, in loose pyramidal spikes. E. Eu., W. Asia.

cæspitosa (*C. pusilla*). To 6 in., tufted: lvs. ovate, toothed: fls. blue, ½ in. long, nodding, solitary. Eu.

calycanthema: *C. Medium* var.

carnica. To 1 ft.: lvs. linear or linear-lanceolate, the lover oval: fls. blue, ¾ in. long, solitary or few. Eu.

carpatica. To 1½ ft., glabrous: lvs. ovate, 1½ in. long, toothed, the basal long-stalked: fls. bright blue, to 2 in. across, open bell-shaped, solitary, erect. E. Eu. Var. **alba** has white fls. and **cœlestina** sky-blue. Var. **turbinata** (*C. turbinata*) decumbent with top-shaped fls.

cenisia. To 2 in., tufted: lvs. obovate, ¼ in. long, entire and ciliate: fls. deep blue, to ½ in. long, solitary, erect. Alps.

cervicaria. Bien. to 2 ft., hairy: lvs. linear-lanceolate to linear, to 6 in. long, toothed: fls. blue, ½ in. long, in terminal bracted heads. Eu.

collina. To 1 ft.: lvs. oblong to lanceolate, the lower long-stalked: fls. deep blue, in few-fld. one-sided racemes. Caucasus.

divaricata (*C. flexuosa*). To 3 ft., glabrous: lvs. ovate-lanceolate, sharp-toothed, to 3 in. long: fls. pale blue, ¼ in. long, nodding, in compound panicles. Va. to Ga. and Tenn.

drabifolia (*C. attica*). Ann. to 6 in., hairy: lvs. oval-oblong, to ½ in. long, toothed: fls. blue with white tube, to ½ in. long, solitary. Greece, Asia Minor.

Elatines. To 6 in., pubescent: lvs. ovate, sharp-toothed, the lower long-stalked: fls. purplish, ¼ in. long, in loose racemes, the style exserted. Piedmont.

elatinoides. To 9 in., hairy: lvs. oval, coarsely toothed, the lower long-stalked: fls. blue. Italy.

elegans. To 3 ft.: lvs. ovate-lanceolate, toothed, the lower long-stalked: fls. blue, 1¼ in. long, nodding, in long terminal spikes. Siberia.

Erinus. Ann. to 9 in.: lvs. oval, deeply toothed, the lower short-petioled: fls. pale bluish with white center, ½ in. across, in long racemes. Medit. region.

excisa. To 5 in., glabrous: lvs. linear, about 1 in. long, entire: fls. pale blue, ½ in. long, solitary. Alps.

fenestralis: a listed name.

fenestrellata. Sts. decumbent or ascending, to 8 in. long: lvs. ovate-cordate, toothed: fls. lilac, ½ in. across, in racemes. Croatia, Dalmatia.

flexuosa: *C. divaricata.*

fragilis. To 6 in., with trailing sts.: lvs. round-cordate to ovate-lanceolate, toothed, the lower long-stalked: fls. purplish-blue with white center, 1½ in. across, in corymbs. Italy.

garganica. Branches trailing to 10 in., nearly glabrous: lvs. ovate, toothed: fls. blue, wheel-shaped, to ¾ in. across, solitary or few, stamens and style exserted. Italy, Dalmatia. Var. **hirsuta** is hairy.

glomerata. To 2 ft.: lvs. ovate, to 5 in. long, toothed, the basal long-stalked: fls. blue or white, to 1 in. long, often double, in dense clusters. Eu., Asia. Var. **acaulis** has sts. to 5 in. high. Var. **dahurica** has clusters 3 in. across. Var. **superba** has deep violet fls. in large clusters.

grandiflora: *Platycodon grandiflorum.*

grandis: *C. latiloba.*

Grossekii. To 2½ ft., stiff-hairy: lvs. ovate, coarsely toothed: fls. violet, large, in long racemes, with appendages or wings and stiff hairs on calyx-tube. S. Eu. —See *C. Trachelium.*

hirsuta: perhaps *C. garganica* var. is meant by the catalogue name.

isophylla. Sts. trailing, making good basket-plant: lvs. cordate-ovate, to 1½ in. long, the lower long-stalked: fls. pale blue, saucer-shaped, 1 in. across, solitary, numerous. Italy. Var. **alba** has white fls.

istriaca. Much like *C. Portenschlagiana* but robust, sts. straw-colored, lvs. whitish, fls. large (¾ in. across) on villous peduncles: plant hairy-tomentose, the sts. to 12 in. long: lvs. cordate or ovate, toothed: fls. blue, with reflexed corolla-lobes. Istria (N. Adriatic).

kolenatiana. To 9 in.: lvs. ovate, toothed, 1 in. long: fls. bluish-violet, 1 in. long, nodding, in racemes. Caucasus.

lactiflora. To 4 ft. or more: lvs. oval-oblong, to 3 in. long, toothed: fls. milk-white (var. **alba**) or pale blue (var. **cærulea**), 1 in. long, in terminal panicles, Caucasus.

lasiocarpa. To 6 in., nearly glabrous: lvs. obovate to linear, to 1¾ in. long, sharp-toothed: fls. blue, to 1 in. long, solitary. N. N. Amer., N. Asia.

latifolia. To 4 ft., hairy: lvs. oblong-ovate, to 6 in. long, toothed, the lower long-stalked: fls. purplish-blue, 1¼ in. long, solitary. Eu., Asia. Var. **alba** has white fls. Var. **macrantha** (*C. macrantha*) has fls. to 2¼ in. long.

latiloba (*C. grandis*). To 4 ft., glabrous: lvs. lanceolate, to 5 in. long, toothed: fls. blue, to 2 in. across, solitary or clustered, with 3 long styles. Caucasus. Var. **alba** has white fls.

Laurii: a listed name.

lingulata. Bien. to 1 ft., bristly-hairy: lvs. oblong-spatulate, wavy-toothed: fls. in sessile heads. S. E. Eu.

longestyla. To 2½ ft., hairy: lvs. oval to oblong, the basal lobed and with winged petiole: fls. blue-purple, constricted below middle, nodding. Caucasus. Var. **parviflora** has smaller fls.

Loreyi: *C. ramosissima.*

macrantha: *C. latifolia* var.

macrorrhiza. Tufted, with thick rootstocks: lvs. ovate to linear, toothed: fls. blue, solitary, erect. S. Eu.

macrostyla. Ann. to 2 ft., hairy: lvs. ovate-oblong, to 2 in. long, nearly entire: fls. purple, broad-bell-shaped, to 2½ in. across, solitary, erect, stigma to 1 in. long. Asia Minor.

Medium. CANTERBURY BELLS. Popular bien. to 4 ft., hairy: lvs. oblanceolate, to 10 in. long, toothed and wavy: fls. violet-blue, 1 in. across, 1–2 together and forming open racemes. S. Eu. Color forms are vars. **alba** and **rosea**. Var. **calycanthema** has corolla-like calyx, resembling the corolla in the Hose-in-Hose or Duplex race, and in the Cup-and-Saucer race spreading or wheel-shaped.—All forms are excellent for late spring and summer bloom.

michauxioides. To 4 ft., hairy: lvs. ovate-cordate to oblong, coarsely toothed, the lower long-stalked: fls. pale blue, nodding, in panicles. Asia Minor.

mirabilis. To 1 ft.: lvs. obovate, to 6 in. long, coarsely toothed, with winged petioles: fls. pale lilac, 2 in. across, erect, numerous. Caucasus.

mollis (*C. velutina*). To 8 in., gray-tomentose, sts. procumbent: lvs. ovate or obovate: fls. purplish-blue or lavender with white throat, erect. Spain, Crete.

muralis: *C. Portenschlagiana.*

nobilis: *C. punctata.*

Pallasiana: *C. pilosa.*

patula. To 2 ft.: lvs. obovate to lanceolate, toothed: fls. violet or blue, 1 in. long, solitary, forming panicles. Eu.

pentagonia: *Specularia pentagonia.*

persicifolia. To 3 ft., glabrous: lvs. oblanceolate to linear, to 8 in. long, fine-toothed: fls. blue or white, to 1½ in. long, in terminal racemes. Eu. Some of the hort. vars. are **alba grandiflora** with large white fls., **Backhousei**, white fls., **flore-pleno** and **humosa** double forms, **macrantha** with larger fls., **Moerheimei** with double white fls. to 3 in. across.

petiolata. The western representative of *C. rotundifolia:* basal lvs. long-petioled, usually longer than broad. B. C. to Calif. and New Mex.

petræa. Bien. to 1 ft.: lvs. lanceolate to ovate, toothed, gray-hairy beneath: fls. pale yellow, ½ in. long, in dense heads. S. Eu.

phyctidocalyx (*C. amabilis*). To 2½ ft., glabrous: lvs. oblong to lanceolate, wavy-toothed: fls. dark blue, in racemes. W. Asia.

pilosa (*C. Pallasiana*). To 9 in., pubescent: lvs. ovate to linear, toothed: fls. blue, 1 in. long, solitary, hairy within. N. Asia to Alaska.

Piperi. Glabrous, with many leafy sts. to 4 in. high: lvs. cuneate or spatulate, sharp-serrate, to 1½ in. long, persistent: fls. bright blue, corolla ½–¾ in. long, broad-campanulate. Olympic Mts., Wash.

Portenschlagiana (*C. muralis*). To 9 in., diffuse or decumbent: lvs. orbicular or reniform, to 1 in. across, coarsely toothed, long-stalked: fls. blue-purple, to 1 in. long, 1–3 together. Dalmatia.

primulæfolia. To 3 ft., hairy: lvs. lanceolate to oblong, coarsely toothed: fls. blue or purple, tomentose at bottom, wheel-shaped, in racemes. Portugal.

pseudo-carnica: listed name.

pulla. To 8 in., tufted, glabrous: lvs. ovate, toothed: fls. dark purple, nodding, solitary. E. Eu.

pulloides. Supposed hybrid between *C. pulla* and *C. carpatica* var. *turbinata:* fls. blue-purple.

punctata (*C. nobilis*). To 2 ft., hairy: lvs. ovate, to 5 in. long, coarsely toothed, the lower long-stalked and cordate: fls. white spotted inside or lilac-blue in "Marian Gehring," 2 in. long, nodding, solitary. Asia.

pusilla: *C. cæspitosa.*

pyramidalis. CHIMNEY B. To 5 ft., glabrous: lvs. ovate, 2 in. long, toothed, the lower long-stalked and cordate: fls. pale blue, 1 in. or more long, saucer-shaped, in narrow racemose panicles. S. Eu. Var. **alba** has white fls.

pyrenaica. To 1 ft., soft-hairy: lvs. lanceolate or basal oval and toothed: fls. solitary. Pyrenees.

Raddeana. To 1 ft., glabrous: lvs. ovate, toothed, the lower deeply cordate and long-stalked: fls. dark purple, ¾ in. long, solitary in axils. Caucasus.

Rainerii. To 3 in.: lvs. ovate, toothed: fls. dark purplish-blue, to 1½ in. long, solitary, erect. N. Italy.

ramosissima (*C. Loreyi*). Ann. to 1 ft., nearly glabrous: lvs. obovate to lanceolate, to 2 in. long, toothed: fls. violet, whitish at base, 1 in. across, saucer-shaped, solitary, erect. S. E. Eu. Var. **alba** has white fls.

rapunculoides. To 3 ft.: lvs. ovate to ovate-lanceolate, to 4 in. long, toothed, the lower long-stalked and cordate: fls. blue, 1 in. long, nodding, in one-sided terminal racemes. Eu., Asia; escaped in N. Amer.

Rapunculus. RAMPION. To 3 ft., with thick taproot, usually bien.: basal lvs. oval, to 8 in. long, long-stalked, wavy-toothed; st.-lvs. linear-lanceolate: fls. lilac, ½ in. long, in narrow racemes. Eu.

rhomboidalis. To 2 ft., nearly glabrous: lvs. ovate, to 2 in. long, toothed: fls. purplish-blue, to 1 in. long, nodding, in racemes. Eu. Var. **alba** has white fls.

Robsoni. Described as a hybrid between *C. carpatica* var. *turbinata* and *C. Scheuchzeri*, with deep blue fls.

rotundifolia. Bluebell. Harebell. To 1½ ft., slender: basal lvs. ovate or orbicular, 1 in. across, long-stalked; st.-lvs. linear or lanceolate, to 3 in. long: fls. bright blue, to 1 in. long, in loose racemes. Eu., Asia, N. Amer. Var. **alba** has white fls. Var. **Hostii** has larger fls. Var. **soldanellæflora** has fls. partially double and the corolla split into shreds.

sarmatica. To 2 ft.: lvs. oblong, toothed, gray-tomentose and rough, the lower long-stalked: fls. pale blue, 1 in. long and 1½ in. across, nodding, axillary. Caucasus.

Saxifraga. To 6 in.: lvs. linear or linear-lanceolate, nearly entire, ciliate: fls. violet, to 1 in. long, solitary. Caucasus.

Scheuchzeri. To 1 ft.: lvs. ovate to linear, toothed: fls. dark blue, to ¾ in. long, nodding, usually solitary. N. N. Amer., Eu., N. Asia.

sibirica. Bien. or per. to 1½ ft., bristly-hairy: lvs. obovate and crenulate, those on st. lance-acuminate: fls. violet, 25 or more in a panicle, drooping. Eu., Asia.—Variable.

speciosa. To 1 ft., very hairy: lvs. oblong- to linear-lanceolate, toothed: fls. blue, 1 in. long, solitary in the axils and forming a pyramidal raceme. S. Eu.

Speculum: *Specularia Speculum-Veneris.*

spicata. Bien. to 2 ft., hairy: lvs. linear-lanceolate, nearly entire: fls. blue, in a long interrupted spike. Eu.

Stansfieldii. Supposed hybrid, perhaps between *C. carpatica* and *C. Waldsteiniana;* described as a creeper with deep purple fls.

Steveni. Low, in clumps or mats, with ascending sts.: lvs. oblong-spatulate, entire or crenate, those on sts. linear: fls. purple-blue, 1–4 on a st. Caucasus, Siberia, in mts.

thyrsoides. Bien. to 1½ ft., hairy: lvs. spatulate, to 2½ in. long, forming rosettes: fls. yellow, in a dense spike. Eu.

Tommasiniana: *C. Waldsteiniana.*

Trachelium. To 3 ft., rough-hairy: lvs. ovate-lanceolate, to 3 in. long, coarsely toothed, the lower long-stalked: fls. blue-purple, to 1 in. long, sometimes double, nodding, in loose racemes. Eu., Asia; escaped in N. Amer. Var. **alba** has white fls.—Sometimes grown as *C. Grossekii*, but it has no appendages on calyx-tube.

tridentata. To 5 in.: lvs. oblong to linear, ciliate, entire except the 3-toothed apex: fls. deep blue, solitary. Asia Minor.

turbinata: *C. carpatica* var.

velutina: *C. mollis.*

versicolor. To 4 ft., glabrous: lvs. ovate to ovate-lanceolate, toothed, the lower long-stalked: fls. pale blue with violet throat, in long spike-like racemes. Greece.

Vidalii. To 2 ft., glabrous and clammy: lvs. oblong, to 4 in. long, coarsely toothed: fls. white with yellow base, 2 in. long, nodding, in short racemes. Azores.

Waldsteiniana (*C. Tommasiniana*). To 6 in., glabrous: lvs. lanceolate, slightly toothed: fls. purplish-blue with darker throat, wheel-shaped, ¾ in. across, in racemes. S. Eu.

warleyensis: a garden form.

Zoysii. To 4 in., tufted, the sts. few-fld.: lvs. ovate or obovate, entire, those on st. becoming oblanceolate: fls. pale blue, mostly terminal on 1-fld. peduncles, the corolla cylindrical and constricted at apex. Austria, alpine.

CAMPANULACEÆ. Bellflower Family. About 40 genera of widely distributed herbs, shrubs or trees, with usually alternate simple lvs., bisexual mostly showy fls. prevailingly in blue, and having gamopetalous 5-lobed corolla, 5 stamens, mostly inferior 1–5-celled ovary, and fr. a dehiscent caps. Several herbaceous genera are popular flower-garden subjects, as Adenophora, Campanula, Canarina, Codonopsis, Edraianthus, Jasione, Michauxia, Ostrowskia, Phyteuma, Platycodon, Specularia, Symphyandra, Trachelium, Wahlenbergia. For the most part they are of simple cultural requirements.

CAMPANULATE: bell-shaped.

CAMPE: *Barbarea.*

CAMPHORA OFFICINARUM: *Cinnamomum Camphora.*

CAMPHOROSMA. *Chenopodiaceæ.* Small shrubs or herbs with camphor-like odor, native in Eu., Asia and Afr., having needle-like lvs. and small fls. in dense spikes toward ends of branches; intro. in Calif.

monspeliacum. Hairy subshrub to 2 ft.: lvs. clustered: fls. whitish, solitary in the axils and forming leafy spikes. Medit. region.

CAMPHOR-TREE: *Cinnamomum Camphora.*

CAMPION: *Lychnis, Silene.*

CAMPSIDIUM. *Bignoniaceæ.* Evergreen climbing shrubs with pinnate lvs., orange tubular 5-lobed fls. in terminal racemes, and narrow capsular frs.; grown out-of-doors in S. U. S. Propagated by cuttings of green wood under glass.

valdivianum. Lvs. of 11–13 oval-oblong sessile lfts. to 1½ in. long, toothed at tip: fls. 1½ in. long, the racemes drooping: caps. to 4 in. long. Chile.

CAMPSIS. Trumpet-Creeper. *Bignoniaceæ.* Two shrubs climbing by aerial rootlets, having deciduous pinnate lvs. with toothed lfts., orange or scarlet funnelform fls. in late summer with spreading 5-lobed limb, and fr. a long dehiscent caps.

The trumpet-creepers thrive in fertile soil in sunny locations. *C. radicans* is fairly hardy North and both species do well in southern United States. Propagated by seeds, cuttings of green wood under glass, layers, and cuttings of mature wood or roots.

chinensis (*Bignonia chinensis. Tecoma* and *Bignonia grandiflora*). Chinese T. Lvs. of 7–9 ovate or ovate-lanceolate glabrous lfts. to 2½ in. long: fls. scarlet, to 3 in. across, the tube only slightly longer than the deeply 5-lobed calyx. China.

hybrida (*Bignonia* and *Tecoma Princei*). Hybrid between *C. chinensis* and *C. radicans* with fls. to 3 in. long and 2 in. across.

radicans (*Bignonia* and *Tecoma radicans*). Trumpet-Vine. Lvs. of 9–11 oval lfts. to 2½ in. long, pubescent at least on midrib beneath: fls. orange with scarlet limb 2 in. across, the tube 3 in. long, about 3 times as long as short-toothed calyx. Pa. to Fla. and Tex.

CAMPTOSORUS. Walking-Fern. *Polypodiaceæ.* Hardy small ferns with simple long-pointed lvs. that root at the tip and therefore are called "walking fern" or "walking leaf"; sori linear or oblong, irregularly scattered; 2 species, the native one, growing on lime-bearing rocks, used somewhat in rock- and wild-gardens; the other is N. Asian.

rhizophyllus. Lvs. evergreen, to 9 in. long, heart-shaped at base, tapering to a long often thread-like point. Que. to Ga. and Ala.

CAMPTOTHECA. *Nyssaceæ.* One deciduous tree native in China and intro. into S. Calif. **C. acuminata.** To 75 ft., quick-growing, with pale gray smooth bark: lvs. alternate, ovate, to 6 in. long: fls. small, polygamous, in heads which are solitary or racemose, the white stamens long-exserted: fr. a samara about 1 in. long, brown and shining.

CAMPYLOBOTRYS: *Hoffmannia Ghiesbreghtii.*

CAMPYLONEURON: *Polypodium Phyllitidis.*

CAMPYLOTROPIS. *Leguminosæ.* Deciduous shrubs and subshrubs of Asia distinguished from Lespedeza by the pedicels mostly solitary in the axils of usually deciduous bracts and jointed below the calyx rather than usually 2 in the axils of persistent bracts and not jointed.

macrocarpa (*Lespedeza macrocarpa. L. chinensis. L. ciliata*). To 3 ft.: lfts. 3, oblong, to 2 in. long, not pointed, silky underneath: fls. purple, about ⅓ in. long, in attractive racemes. China; hardy N.

CAMWOOD: *Baphia racemosa.*

CANAIGRE: *Rumex hymenosepalus.*

CANANGA (*Canangium*). *Annonaceæ.* Malayan trees with alternate simple lvs., large fls. in axillary clusters, and fr. of many oblong fleshy carpels; one species is grown for ornament and for the perfume derived from the fls. It requires a warm or trop. climate.

odorata. Ylang-Ylang. To 80 ft.: lvs. oblong-ovate, to 8 in. long: fls. greenish or yellowish, drooping, very fragrant, with narrow petals to 2 in. long: fr. greenish, 1 in. long.

CANANGIUM: *Cananga.*

CANARINA. *Campanulaceæ.* One or perhaps more species from the Canary Isls., grown in a cool greenhouse. **C. Campanula.** Per. to 8 ft. with tuberous root: lvs. whorled or opposite: fls. bell-shaped, yellow marked with purplish-brown, 1½ in. across, solitary, the corolla-lobes reflexed: fr. a berry.

CANARY-BIRD-FLOWER: *Tropæolum peregrinum.*

CANAVALIA. *Leguminosæ.* Trop. herbs or sts. somewhat woody, with pinnate lvs. of 3 lfts., papilionaceous fls. in axillary racemes, and large flat woody pods strongly ribbed near upper margin.

Sometimes grown for ornament in warm countries, as stock feed, a green-manure crop, and the beans for human food. Adapted to about the same climatic conditions as cotton and require a long season. Seeds should be planted 6 to 12 inches apart in rows 3 feet apart.

ensiformis. Jack Bean. Ann., partially erect, to 4 ft.: fls. purple: pods to 14 in. long, with white seeds. W. Indies.

gladiata. Sword Bean. Twining: pods to 12 in. long, with seeds usually red, pink or brown. Tropics of Old World.

CANDLE-BERRY-TREE: *Aleurites moluccana.*

CANDLENUT: *Aleurites molucanna.*

CANDLE-PLANT: *Senecio articulatus.*

CANDLE-TREE: *Parmentiera cereifera.*

CANDOLLEA. *Dilleniaceæ.* Shrubs or herbs with alternate simple lvs. and mostly yellow fls. few or solitary at ends of branches, the parts mostly in 5's; grown in S. Calif. or sometimes under glass.

cuneiformis (*Hibbertia cuneiformis*). Shrub to 6 ft.: lvs. oblong, 1 in. long, toothed at apex: fls. ½ in. or more long, solitary and sessile. Australia.

CANDYTUFT: *Iberis.*

CANELLA. *Canellaceæ.* One evergreen tree of S. Fla. and W. Indies. **C. Winterana** (*C. alba*). Wild Cinnamon. To 45 ft., often shrubby, with gray aromatic bark: lvs. oblanceolate or spatulate, to 4 in. long, obtuse, shining above: fls. purple, red or violet, to ¾ in. long, in corymbs, anthers yellow: fr. a crimson berry ¼ in. across.

CANELLACEÆ. Canella Family. Five genera of aromatic trees or shrubs native in trop. Amer. and Afr., having alternate entire lvs., bisexual fls. of 3 sepals, 4–12 or no petals, many stamens with filaments united in tube, superior 1-celled ovary, and fr. a berry. Canella may be grown in S. Fla. or S. Calif.

CANESCENT: gray-pubescent and hoary, or becoming so.

CANE, SOUTHERN: *Arundinaria macrosperma.*

CANISTEL: *Lucuma nervosa.*

CANISTRUM. *Bromeliaceæ.* Brazilian terrestrial or epiphytic herbs with lvs. in a basal rosette and green, yellow or blue fls. in heads or spikes subtended by colored bract-lvs.; occasionally cult. in the greenhouse. Cult. as for *Bromelia.*

amazonicum (*Nidularium amazonicum*). Lvs. to 1½ ft. long and 3 in. wide, finely toothed, brownish: fls. greenish-white, in dense heads.

aurantiacum. Lvs. to 2 ft. long and 2 in. wide, finely toothed, spotted with dark green when young: fls. orange-yellow, in dense heads, the inner bract-lvs. bright red.

Lindeni (*Nidularium Lindeni*). Lvs. to 2 ft. long and 3 in. wide, finely toothed, green spotted with darker green: fls. pure white, in dense heads.

CANNA. *Cannaceæ.* Striking tall erect tender per. herbs with thick branching rootstocks and mostly simple main sts., grown usually in masses and lines for foliage effect and the showy terminal fl.-clusters; botanical characters of the family (Cannaceæ); native in tropics and subtropics. They reach 2½ to 10 ft. in height, bearing large simple lvs. that are sometimes bronzy. Few of the original species are in common cult., those known to hort. being hybrid or other derivatives.

Of easy cultivation in fertile moist deeply-prepared soil; in the North, cannas should not be planted out until all danger of frost is past. In spring, old roots should be divided before planting; for mass effects, plants may stand 12–24 inches apart. In autumn the roots should be dug and stored over winter in a warm dry place. The usual method of rapid multiplication is by division of the roots, each piece having a bud. These pieces should be started in heat in early April, covering them 2 or 3 inches in loose soil. Also propagated by seed sown in flats or pots in February and March and grown over heat; the seedlings usually bloom the first year; new varieties are obtained this way. To hasten germination, seeds may be soaked in warm water before sowing, or the seed-coat notched or filed.

edulis. Edible C. Bearing edible tubers which are cult. under the name "Tous-les-mois": to 10 ft., st. purple: lvs. to 2 ft. long, purplish beneath: fls. bright red, 3 upper staminodia varying to orange and 2½ in. long. W. Indies, S. Amer.

flaccida. To 5 ft., st. green: lvs. to 2 ft. long and 5 in. wide: fls. tubular at base, yellow, the petals strongly reflexed and the 3 staminodia to 3 in. long. S. C. to Fla.—The most important parent of the orchid-fld. cannas.

generalis. Common Garden C. Varying in height and color of foliage but usually glaucous: fls. not tubular at base, in many colors, to 4 in. across, with commonly 4 erect staminodes, and petals not reflexing. Of garden origin.—The original Crozy or French cannas are incorporated in this group.

glauca. To 6 ft., st. glaucous: lvs. 1½ ft. long and 4 in. wide, white-edged: fls. yellow, sometimes spotted or tinged with red in hort. forms, the 3 upper staminodia to 3 in. long. Trop. Amer.

indica. Indian Shot. To 4 ft., st. green: lvs. to 1½ in. long and 8 in. wide: fls. bright red, the lip orange spotted with red, 3 upper staminodia 2 in. long. Trop. Amer.; spontaneous in S. U. S.

iridiflora. To 10 ft., st. green: lvs. to 4 ft. long and 1½ ft. wide: fls. rose, drooping, the corolla-tube 2½ in. long. Peru.

orchiodes. Orchid-flowered C. Foliage green or bronzy: fls. tubular at base, yellow to red, striped and splashed, to 6 in. across, with soft flowing outlines, the petals reflexed after first day, having 5 staminodes. Of garden origin.—To this group belong such varieties as Italia and Austria.

Warscewiczii. To 5 ft., st. purplish or brown-purple: lvs. about twice as long as broad: fls. scarlet often tinged with blue, the 2 or 3 upper staminodia to 3 in. long. Costa Rica, S. Amer.

CANNABIS. *Moraceæ.* One variable ann. herb native in temp. Asia and nat. in E. N. Amer., grown for the fiber obtained from the inner bark and sometimes for ornament. **C. sativa** (*C. gigantea*). Hemp. To 12 ft.: lvs. alternate, digitately divided into 3–7 narrow toothed lfts. to 9 in. long: staminate fls. in panicled racemes to 1 ft. or more long; pistillate spikes short and leafy: fr. a small achene.—Hemp thrives on soil rich in humus and with a good moisture supply. Propagated by seeds sown where plants are to stand or started in boxes indoors. For field cult. about 1 bushel of seed is used for an acre, sown at a depth of 2 in. Hemp sown late in Apr. should be ready for cutting early in Sept.

CANNACEÆ. Canna Family. One trop. or subtrop. genus of some 30 species, having alternate entire lvs. with sheathing petioles and red or yellow fls. in terminal spikes, racemes or panicles, of peculiar structure: sepals 3, small; petals 3 and sepal-like, remaining erect or reflexing; showy part of fl. represented by 2–5 petal-like staminodia, one reflexed and forming the lip; ovary inferior, 3-celled: fr. a dry caps.

CANTALOUPE: *Cucumis Melo;* see *Melon.*

CANTERBURY BELLS: *Campanula Medium.*

CANTUA. *Polemoniaceæ.* S. American shrubs or small trees with opposite simple lvs. and red, violet or white long-tubular fls. in terminal clusters; grown in a cool greenhouse or out-of-doors in mild climates. Propagated by cuttings under glass.

bicolor. Similar to *C. buxifolia* but with shorter lvs. and solitary fls. with a short yellow tube. Peru.

buxifolia. Shrub to 10 ft.: lvs. 1 in. or less long, entire: fls. narrow, pinkish-red striped with yellow, to 3 in. or somewhat more long, handsome. Peru, Bolivia, N. Chile.

CAOUTCHOUC TREE: *Hevea brasiliensis.*

CAPER-BUSH: *Capparis spinosa.*

CAPILLARY: hair-like; very slender.

CAPITATE: headed; in heads; formed like a head; aggregated into a very dense or compact cluster.

CAPNOIDES: *Corydalis.*

CAPPARIDACEÆ. Caper Family. About 35 trop., subtrop. and temp. genera of herbs and shrubs, sometimes trees, with simple or palmately compound lvs., mostly bisexual irregular fls. with 4–8 sepals and petals or rarely petals lacking, 6 to many stamens, superior sessile or stalked 1-celled ovary, and fr. a caps. or berry. Capparis, Cleome and Polanisia are known to hort.

CAPPARIS. *Capparidaceæ.* Shrubs or trees with simple lvs., large white fls. in corymbs, the ovary long-stalked, and berry-like frs.; one species grown for the flower-buds which are pickled and sold as capers. Propagated by cuttings in heat or by seeds. Not hardy N., but may be grown as annual.

rupestris: *C. spinosa.*

spinosa (*C. rupestris*). Caper-Bush. Spiny shrub to 3 ft.: lvs. roundish, to 2 in. long: fls. about 1 in. long, solitary on thick stalks. Medit. region. Var. **inermis** is unarmed.

CAPRIFOLIACEÆ. Honeysuckle Family. Thirteen widely distributed genera consisting mainly of shrubby plants: lvs. opposite, simple or pinnate: fls. bisexual, with 4–5-toothed calyx, gamopetalous 4–5-lobed corolla, 4–5 stamens, and inferior usually 1–5-celled ovary: fr. a berry, drupe, achene or caps. The family furnishes many very attractive ornamental plants in the genera Abelia, Alseuosmia, Diervilla, Dipelta, Kolkwitzia, Leycesteria, Linnæa, Lonicera, Sambucus, Symphoricarpos, Triosteum, Viburnum, Weigela.

CAPRIOLA: *Cynodon.*

CAPSICUM. Red-Pepper. *Solanaceæ.* Shrubs but grown mostly as herbaceous annuals in the N., much branching and glabrous: lvs. simple and entire: fls. small, white or greenish-white sometimes tinged violet, corolla wheel-shaped: fr. a pod-like many-seeded fleshy indehiscent berry varying widely in size, shape, color and pungency under cult. For cult. see *Pepper.*

annuum: *C. frutescens.*

baccatum: *C. frutescens.*

frutescens (*C. annuum. C. baccatum*). Shrub to 8 ft., trunk becoming 3 in. through: lvs. from 1–5 in. long: fls. about ½ in. across: fr. variable, erect, declined or drooping. Native in warm countries. The type of *C. frutescens* is the Bird Pepper, with erect spherical or oblong fr. to ¾ in. long, usually red. The races with developed frs. may be grouped as follows: Var. **cerasiforme.** Cherry P. Fr. erect or declined, spherical, to 1 in. across, yellow or purplish, very pungent. Var. **conoides.** Cone P. Fr. conical or oblong-cylindrical, to 2 in. long, usually erect. Var. **fasciculatum.** Red Cluster P. Fr. erect, fascicled, very slender, to 3 in. long, red, very pungent. Var. **grossum.** Bell or Sweet P. Tall, stout: fr. large and puffy with depression at base, sides usually furrowed, oblong, bell-shaped or apple-shaped, red or yellow, mild in flavor. Var. **longum.** Long P. Fr. mostly drooping, elongated to 1 ft. long, usually tapering to apex, often 2 in. across at base; includes Long Red, Long Yellow, Chilli, Cayenne and others.

CAPSULE: a dry fruit of more than one carpel, usually opening at maturity; compound pod.

CARAGANA. Pea-Tree. Pea-Shrub. *Leguminosæ.* Shrubs or small trees mostly from Cent. Asia, with deciduous pinnate lvs., papilionaceous mostly yellow fls. borne singly or in few-fld. clusters, and linear cylindrical pods; grown for ornament, hardy in central and northern states.

Pea-trees should be planted in sunny positions in open soil. Propagated by seeds sown in fall, or in spring after being soaked in warm water; by root-cuttings, layers, or grafting on *C. arborescens.*

altagana: *C. microphylla.*

arborescens. To 20 ft.: lfts. 4–6 pairs, the stipules spiny: fls. yellow, May–June. Siberia, Manchuria. Var. **pendula** has pendulous branches.

aurantiaca. To 4 ft.: lfts. of 2 pairs, the stipules spiny: fls. orange-yellow, May-June. Cent. Asia.

Chamlagu. To 4 ft.: lfts. of 2 pairs, the lf.-stalk spine-tipped: fls. reddish-yellow, May. N. China.

ferox: *C. spinosa.*

frutescens: *C. frutex.*

frutex (*C. frutescens*). To 10 ft.: lfts. of 2 pairs: fls. bright yellow, in May. S. Russia to Japan. Var. **grandiflora** has larger fls.

Maximowicziana. To 6 ft.: lfts. of 2–3 pairs, the stipules spiny: fls. bronzy-yellow. W. China.

microphylla (*C. altagana*). To 10 ft.: lfts. of 6–9 pairs, the lf.-stalk with short deciduous spine: fls. yellow, May–June. Siberia, China.

pygmæa. To 4 ft. or sometimes prostrate: lfts. of 2 pairs, the lf.-stalk spine-tipped: fls. yellow, May–June. Caucasus to Tibet.

spinosa (*C. ferox*). To 6 ft. or sometimes prostrate, the branches spiny: lfts. of 2–4 pairs, those of spurs with 2 pairs. Siberia.

CARAMBOLA: *Averrhoa Carambola.*

CARARA CORONOPUS: *Coronopus procumbens.*

CARAWAY: *Carum Carvi.*

CARDAMINE. Bitter-Cress. *Cruciferæ.* One little per., **C. pratensis**, Ladys-Smock or Cuckoo-Flower, native in Eu. and the northernmost U. S. and northward, is sometimes grown for its bright white or rose-colored fls., often double. It is a spring bloomer, the erect sts. 1–1½ ft. high, adapted to rock-gardens and cool moist borders or to bog-margins. In parts of Eu. the lvs. are said to be used as a cress. Propagated usually by offsets, but may be started from seed. The genus Cardamine, of temp. regions, has many species some of which are showy, but they appear not to be in general cult. They are little ann., bien. and per. herbs, bearing linear pods or siliques.

CARDAMON: *Elettaria.*

CARDIANDRA. *Saxifragaceæ.* Japanese and Chinese subshrubs, sometimes essentially herbaceous, with alternate lvs. and small fls. surrounded by large sterile fls. borne in summer in terminal corymbs; not hardy N. Propagated by cuttings of young wood under glass.

alternifolia. To 3 ft.: lvs. elliptic, to 7 in. long, coarsely toothed: fls. pink, lilac or white. Japan.

CARDINAL-CLIMBER: *Quamoclit Sloteri.*

CARDINAL-FLOWER: *Lobelia cardinalis.*

CARDIOSPERMUM. Heart-Seed. *Sapindaceæ.* Herbaceous vines with alternate bipinnate coarsely toothed lvs., small irregular polygamous or diœcious fls. in axillary corymbs which have two opposite tendrils, and fr. an attractive inflated caps.

These vines are grown for ornament and for covering trellises and bushes. Propagated by seeds sown where plants are to grow and treated as annuals; in mild regions they may self-sow.

grandiflorum. Slender essentially glabrous vine, probably ann. or bien., with white fls. about ½ in. across and oblong pods to 2 in. long. W. Indies, S. Amer.

Halicacabum. Balloon-Vine. Ann. or bien., perhaps sometimes per., climbing to 10 ft.: fls. white, very small: fr. much inflated, nearly globular but 3-angled, about 1 in. long and broad. Bermuda, Fla., Tex., trop. Amer. but nat. in many parts of world and commonly cult.

hirsutum. Probably ann. or bien., perhaps per., with densely hairy st.: fls. white: fr. much inflated, 3-angled, pubescent, to 2 in. long and much narrower. Afr.

CARDOON: *Cynara Cardunculus.*

CARDUUS. Plumeless Thistle. *Compositæ.* Stout herbs with sessile spiny-toothed or lobed lvs. and spiny heads, solitary or in panicles, the fls. all tubular; pappus bristly but not plumose (see *Cirsium*); native from the Canary Isls. to Japan.

The plumeless thistles grow well in ordinary soil, and are easily propagated by seeds or division. They are employed for bold effects of herbage and bloom.

arabicus: *C. pycnocephalus;* see also *Silybum eburneum.*

benedictus: *Cnicus benedictus.*

Kerneri. Bien. or per., much branched, to 3 ft., sts. with spiny wings: lvs. pinnately lobed: heads solitary or in pairs, rose-purple, to 2½ in. across. Probably Balkans.

Marianus: *Silybum Marianum.*

pycnocephalus (*C. arabicus*). Ann. to 3 ft. or more, spiny: lvs. pinnatifid: heads 2–5, purple. Medit. region.

CAREX. Sedge. *Cyperaceæ.* Per. grass-like herbs of about 900 widely distributed species, having inconspicuous unisexual fls. borne in dense spikes, and achenes inclosed in a sac (perigynium).

Sedges are sometimes planted for edgings in the greenhouse or as pot-plants; many of the native species, with pendent spikes, are useful for colonizing in bogs and along pond borders; some of them make attractive clumps. Propagated by division of the clumps or rhizomes, or by seeds sown in fall.

comans. Densely tufted: lvs. thread-like, to 1½ ft. long. New Zeal.

crinita. To 5 ft.: lvs. several ft. long and to 1½ in. wide. Newf. to Fla. and Tex.

Fraseri (*Cymophyllus Fraseri*). Lvs. evergreen, flat, to 1½ ft. long and 2 in. wide, without midnerve. Va. to N. C.

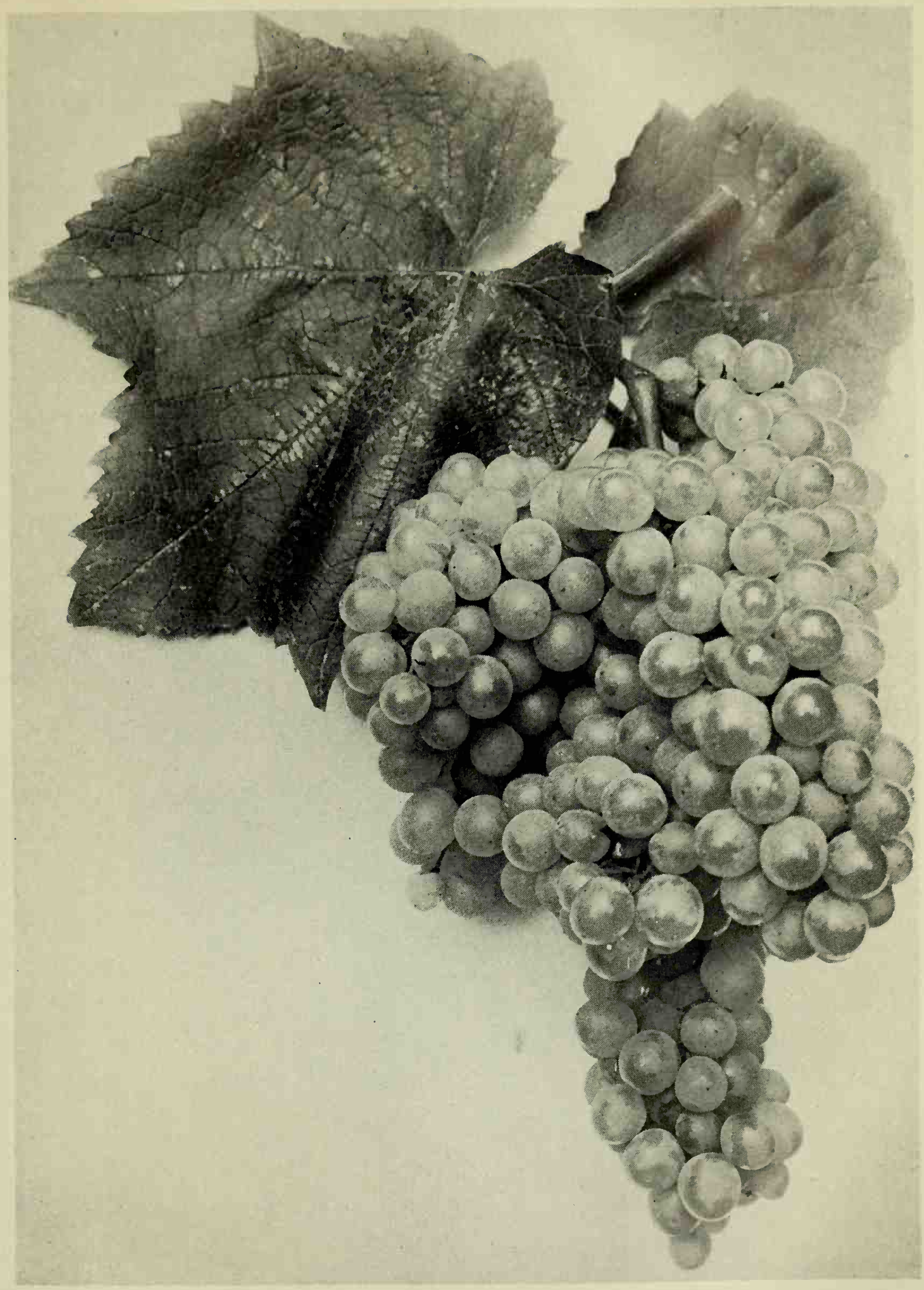
japonica: *C. Morrowii.*

Morrowii (*C. japonica*). Tufted: lvs. evergreen, flat, to 1 ft. long and ¼ in. wide, often white-striped. Japan.

plantaginea. Woods plant with flat persistent strongly ribbed lvs. to 1 in. broad and 1 ft. or more long, and early culms with red-brown sheaths and 3 or 4 fertile spikes. N. B. south and west.—Useful for colonizing and in rock-gardens.

CARICA. *Caricaceæ.* More or less succulent trees, commonly diœcious or often imperfectly so, with straight trunks bearing at summit a crown of palmately lobed lvs., and fr. a fleshy berry resembling a melon; one species is widely grown in the tropics for the edible fr. Commercial papain is also extracted from the fr. and other parts of the plant.

Papayas require tropical temperatures but withstand a few degrees of frost. They do best on rich well-drained loam. Trees bear within a few months after planting but are short-lived. For orchard cultivation they should be set about 10 feet apart. Care must be taken to have both staminate and pistillate plants, although some varieties have bisexual flowers. Propa-



IV. GRAPE. — Stout Seedless, product of Triumph crossed with Dutchess, and then again crossed with Sultanina Rosea

gated by seeds although sometimes cuttings or grafts are employed.

Papaya. PAPAYA. PAWPAW. To 25 ft.: lvs. to 2 ft. across, deeply 7-lobed, the lobes themselves pinnately lobed: fls. yellow, the staminate slender and long-tubed, to 1 in. or more long, in racemes to 3 ft. long, pistillate much broader, solitary or few together; staminate plant sometimes bearing a few pistillate fls.: fr. yellow or orange, to 20 in. long, with thick yellow flesh. Trop. Amer.

CARICACEÆ. PAWPAW FAMILY. Two genera of trees with milky juice, Carica grown for the edible fr. The family is characterized by palmately lobed lvs. in terminal clusters, mostly diœcious fls. having 5-lobed calyx and corolla, 10 stamens, superior 1-celled ovary, and fr. a berry.

CARINATE: keeled: provided with a projecting central longitudinal line or ridge on the lower or under surface, like the keel of a boat.

CARISSA. *Apocynaceæ.* Spiny much branched evergreen shrubs of the tropics of Afr., Asia and Australia, with opposite leathery lvs., milky juice, white or pink mostly fragrant fls. in terminal cymes, and berry-like often showy fr.; grown as popular hedge plants and for the edible frs.

Carissas are grown on almost any soil in regions having only a few degrees of frost. Propagated by cuttings, layers and shield-budding.

acuminata: *C. Arduina.*

Arduina (*C. acuminata. C. bispinosa*). HEDGE-THORN. To 10 ft.: lvs. ovate to oblong, to 3 in. long: fls. white, ½ in. across: fr. bright red, ½ in. long. S. Afr.

bispinosa: *C. Arduina.*

Carandas. KARANDA. Lvs. ovate or oblong, to 3 in. long: fls. white or pink, fragrant: fr. red but becoming black, to 1 in. long. India.

edulis. Straggling much branched shrub: lvs. ovate, to 2 in. long: fls. white or purple, ¾ in. long: fr. purple to black, ⅕ in. across, edible. Egypt.

grandiflora. NATAL-PLUM. AMATUNGULA. To 18 ft.: lvs. ovate, to 3 in. long: fls. white, fragrant, about 2 in. across: fr. scarlet, 1–2 in. long, edible. S. Afr.

ovata. To 4 ft.: lvs. ovate, usually ¾ in. long: fls. ⅕ in. long: fr. to ¾ in. long, edible. Australia.

spinarum. Lvs. ovate, to 1½ in. long: fls. white, ½ in. long: fr. black, ¼ in. across. India, Ceylon.

CARLINA. *Compositæ.* Herbs with spiny usually pinnately cut lvs. and large heads of tubular fls.; involucre with outer row leaf-like, inner often ray-like; pappus with plumose branches; native in Eu. and Asia. Sometimes grown in the rock-garden or similar places.

acanthifolia. Stemless per.: outer lvs. pinnatifid, inner entire, white-tomentose beneath: heads white, solitary, 4 in. across. S. Eu. to W. Asia.

acaulis (*Cirsium acaule. Cnicus acaulis*). Stemless per. to 9 in.: lvs. pinnatifid, glabrous or pubescent beneath: heads white, solitary, to 6 in. across. S. Eu.

CARLUDOVICA. *Cyclanthaceæ.* Shrubby or herbaceous plants with palm-like lvs. and unisexual fls. borne in a dense spadix subtended by bract-like spathes; about 40 trop. American species.

Carludovicas are grown in greenhouses and require abundant water and good drainage after the manner of palms. Propagated by division or by seeds sown on surface of finely chopped sphagnum, after the pulp has been washed off.

atrovirens. Stemless: lvs. 2-lobed to below the middle, glabrous, very dark green. N. S. Amer.

humilis. Dwarf, nearly stemless: lvs. angular, 2-lobed and jagged at tip. Colombia.

Laucheana (*Ludovia Laucheana*). St. very short: lvs. to 12 in. long, 2-lobed to middle or below, the segms. linear-oblong, acuminate, 5- to 7-ribbed. Colombia.

palmata. Stemless: lvs. fan-shaped, 4-lobed nearly to base and the lobes cut, ends drooping. Peru.—The lvs. furnish fiber from which Panama hats are made; frequent in greenhouses.

plicata. Sts. to 1 ft.: lvs. deeply 2-lobed, the segms. 1-nerved. Colombia.

CARMICHÆLIA. *Leguminosæ.* New Zealand shrubs with flattened or cylindrical green branches functioning as lvs., simple or pinnate lvs. which soon fall and leave the plants with bare odd twigs, small papilionaceous fls. in lateral racemes, and small leathery pods; occasionally cult. in warm regions for ornament and interest, as in Calif.

australis. To 12 ft., much branched: lvs. to 2 in. long, of 1–5 lfts.: fls. pale purple, to ⅙ in. long, in 3–12-fld. racemes: pods to ½ in. long.

Enysii. Much branched, forming dense patches 2 in. high: fls. reddish, to ¼ in. long, solitary or in 3–6-fld. racemes: pods to ⅓ in. long.

flagelliformis. To 8 ft., much branched: lvs. to 1½ in. long, of 3–5 lfts.: fls. minute, in 3–7-fld. racemes: pods to ⅓ in. long.

grandiflora. To 6 ft., much branched: lvs. of 3–5 lfts.: fls. purplish veined with violet, ¼ in. long, in 5–12-fld. racemes: pods to ½ in. long.

odorata. To 10 ft., with pendulous branchlets: lvs. to ¾ in. long, pinnately 3–7-parted: fls. white or lilac, ⅙ in. long, in 10–20-fld. racemes: pods to ¼ in. long.

uniflora. Matted, sts. to 2 in. high: fls. purplish-red, ⅓ in. long, solitary: pods to ½ in. long.

Williamsi. To 12 ft. or more, much branched: lvs. of 1–3 lfts.: fls. pale yellow marked with purple, to 1 in. long, solitary or in 2–6-fld. racemes: pods to 1¼ in. long.

CARNATION (*Dianthus Caryophyllus*). A perennial herbaceous fragrant pink or dianthus of many forms, some of which are hardy with protection in the northern states and parts of Canada. In North America the name carnation is ordinarily understood to mean the florists plant, grown under glass for cut-flowers, but it rightly belongs to all the forms of the species. The highly developed large-flowered forms are of two general groups, the border or outdoor carnations and the glasshouse or florists carnations; these are commonly propagated by means of cuttings or layers, to perpetuate particular varieties. The border carnations are little raised or fancied in North America although they are charming plants when well grown. The interest in this general group of plants is represented in the American Carnation Society.

Another group comprises the marguerite carnations, mostly propagated from seeds and that usually bloom the first year, although unspent plants may be carried over winter in the open outside the severer parts of the country and should flower freely the second year. The marguerites make attractive house plants if potted in autumn. The seeds of these carnations may be sown in boxes in March and the young plants set out as early as possible, pinching out the center of the plant to make it branch freely. Give the same space as for other garden pinks, 8–15 inches apart.

The winter-flowering or perpetual carnations have long been favorites although in the commercial field demands change from year to year. They may be considered either as house plants or as florists stock grown in glass ranges. The propagation and general cultural requirements are the same in either case, although the extent of the operations may be very different.

Propagation of carnations for window-garden and greenhouse is by means of cuttings taken from the strong shoots that arise at the base, the side shoots of the flowering stem, or the main shoots before they show flower-buds. The cuttings from the base make the best plants in most cases, or from the middle of strong flower-stems.

For window-garden use, the cuttings may be taken at any time in autumn or winter, rooted in sand and potted up, to be held in pots until planting out time in spring, usually in April, or any time when the ground is ready to handle. Care should be taken to pinch out the tops of young plants while growing in the pot, and later while in the ground, causing them to grow stocky and send out new growths along the stem. The young plants should be grown cool, a temperature of 45° suiting them well. Attention should be given to syringing the cuttings each day while in the house to keep down red-spider. In summer, the plants are grown in the field, and not in pots. The soil in which they are to be planted should be moderately rich and loose. Clean cultivation should be given throughout the summer. Frequently pinch out the tops. The plants are taken up in September and potted firmly, and well watered; then set in a cool partially shaded situation until root growth has started. They are then taken to the residence, on approach of cold weather, to bloom. The usual living-room conditions as to moisture and heat are not such as the carnation demands, and care must be taken to overcome the heat and dryness. Pick off most or all the side buds, to add to the size of the leading flowers. It is probably advisable in most cases to purchase plants from a florist, and after blooming either throw them away or store them for planting in the spring, when they will bloom in the summer. Be sure that plants and cuttings are free from disease.

For commercial or florists work cuttings are preferred from good flowering stems, not choosing either the soft tip or the hardened base. They are cut midway between the joints and inserted a half inch or so in sand, the lower leaves having been removed. The illustration in Fig. 15, page 496, shows a good carnation cutting. The cuttings are set close together in a well-prepared sand bed on a bench. Cuttings are usually taken December to March, for the following winter bloom. When well struck the cuttings are potted, to make ready for planting out in summer.

The plants grow thereafter in the field, being set in late spring when the weather has become settled, and turned out of the pots; the soil should be deep and in a good state of cultivation. They are set 8–10 inches apart in the row. The space between rows is determined by the ground available, and by the method of tillage; it varies from 16–24 inches or even more. Late in summer or at least before freezing weather the plants are dug and removed to greenhouse benches for winter bloom. The exact date of digging will depend somewhat on the strength of the plants and also on the time at which bloom is required. In some cases plants are grown continuously in the house for summer or very early bloom. Blooms may be expected in a month or six weeks after benching.

Benches are refilled with good soil in summer or autumn, the house being thoroughly cleaned. Plants are spaced regularly about 9 by 12 inches on the benches. The beds should be kept uniformly moist until the plants are well rooted. The field stock is assorted before it is brought to the house, and all weak and diseased plants discarded. If plants are dug early, the weak ones may be left for later digging if they are healthy.

Carnations are cool-temperature plants. If the house is too warm the growth becomes soft and the flowers are fewer and of poor quality. About 50° F. night temperature is commonly advised; it may run 10° higher by day; it should be steadily maintained. The house should be well ventilated but cold currents should not strike the plants.

The varieties of florists' carnation are many, and new ones are continuously introduced. The intending grower will need to keep informed on them. The character of bloom depends on the skill in growing as well as on the particular variety. For cut-flowers, the plants are grown to single long stems by pinching out side shoots. The usual blooming season is September or October to May or June, and in this period a plant should yield 18–24 good flowers.

Aphis is controlled by nicotine spray or vapor, and thrips largely by spraying with trade preparations. Red-spider is combatted by the usual method of applying fine water spray under pressure. Rust and other diseases are controlled by propagating only from healthy stock, by disease-free soil, by keeping benches clean and sterile, by maintaining uniform temperature and plenty of fresh air and general good growing conditions with care not to keep the plants wet, by removal of affected plants, and then by dusting with sulfur or by other fungicide.

CARNEGIEA. *Cactaceæ.* One great desert cactus of Ariz., S. E. Calif. and Sonora, Mex., with an erect columnar trunk sometimes with a few akimbo branches, many ribs and strong spines: fls. at or near top of plant. See *Cacti.*

C. gigantea (*Cereus giganteus*). SUWARRO. GIANT CACTUS. Post-like, 20–60 ft., sometimes 2 ft. diam., tapering to either end; ribs 18–21 in mature plants; spines different on fertile and sterile areoles: fls. white, diurnal, 4 in. long or somewhat more: fr. 2–3 in. long, pale red, edible.—Sometimes transplanted from the wild in its native regions or similar climates, but does not thrive under cult.

CARO: *Enterolobium cyclocarpum.*

CAROB: *Ceratonia Siliqua.*

CAROLINEA PRINCEPS: *Pachira aquatica.*

CAROSELLA: *Fœniculum vulgare* var. *piperitum.*

CARPANTHEA. *Aizoaceæ.* One S. African plant separated from Mesembryanthemum (which see for cult.): stigmas and cells of fr. 12–20; expanding keels of caps. terminating in awns. **C. pomeridiana** (*M. pomeridianum*). Ann., with ascending branches to 1 ft.: lvs. spatulate or somewhat narrower, to 4 in. long, flat, narrowed to petiole: fls. yellow, to 2 in. across, on peduncles to 5 in. long, opening in the afternoon.

CARPEL: one of the units of a compound pistil; a simple pistil is one carpel.

CARPENTERIA. *Saxifragaceæ.* One evergreen shrub native in the southern parts of the Sierra Nevada Mts., Calif. **C. californica.** To 10 ft.: lvs. opposite, oblong to lanceolate, to 4 in. long, bright green above, whitish-tomentose beneath: fls. pure white, 2–3 in. across, fragrant, showy, single or few in a cluster, June–July.—Hardy only in warm-temp. regions. It requires a well-drained light and sandy soil, and a sunny sheltered position; the excess of water in winter is especially harmful, probably more than the cold. Propagated by greenwood cuttings under glass in summer, by suckers which are freely produced, and by seeds sown in spring.

CARPET-WEED FAMILY: *Aizoaceæ.*

CARPINUS. HORNBEAM. *Betulaceæ.* Northern hemisphere deciduous monœcious trees of medium or small size, with smooth gray bark, alternate toothed lvs., unisexual fls. in catkins, and fr. a small achene-like nut subtended by a 3-lobed leafy bract; planted for hedges and specimen plants.

Hornbeams are hardy North and thrive in most soils. Propagated by seeds in fall; if seeds do not germinate the next spring the bed should be covered with moss and kept moist until the remaining seed sprout. Varieties may be grafted or budded on seedling stocks.

americana: *C. caroliniana.*

Betulus. EUROPEAN H. To 70 ft.: lvs. ovate or ovate-oblong, to 4 in. long: fruiting catkins to 5 in. long, bracts to 2 in. long, the middle lobe much larger. Eu. to Persia. Some of the hort. vars. are: **carpinizza**, lvs. smaller and often cordate; **columnaris**, of slender pyramidal habit; **fastigiata** (var. *pyramidalis*), of pyramidal form; **incisa**, lvs. deeply lobed; **pendula**, branches drooping; **purpurea**, young lvs. purple; **quercifolia**, lvs. with deep toothed lobes.

caroliniana (*C. americana*). AMERICAN H. BLUE BEECH. To 40 ft., but usually small: lvs. ovate-oblong, to 4 in. long: fruiting catkins to 4 in. long, bracts about 1 in. long, the middle lobe largest. Que. to Fla. and Tex.

cordata. To 50 ft.: lvs. ovate or oblong-ovate, cordate, to 5 in. long: fruiting catkins to 3 in. long, the bracts overlapping. N. Asia.

japonica. To 50 ft.: lvs. oblong-ovate or oblong-lanceolate, to 4 in. long: fruiting catkins to 2½ in. long, the ovate bracts ¾ in. long and overlapping. Japan.

Tschonoskii (*C. yedoensis*). To 50 ft., young branches densely pubescent: lvs. ovate or oblong-ovate, to 3½ in. long: fruiting catkins to 3 in. long, bracts lobed on one side. N. Asia.

yedoensis: *C. Tschonoskii.*

CARPOBROTUS. *Aizoaceæ.* A widely dispersed group separated from Mesembryanthemum on the mostly 10–16 stigmas and fleshy fr.: per. with sts. trailing or decumbent: lvs. opposite, sharply 3-angled and very fleshy: fls. large, showy in sunlight, yellow to reddish and purple: fr. indehiscent, edible. S. Afr., Australia, New Zeal., Calif., Chile. For cult. see *Mesembryanthemum.*

acinaciformis (*M. acinaciforme*). Sts. angled, to 4 ft.: lvs. scimitar-shaped (incurved, acinaciform), widely keeled, to 3 in. long: fls. very large, purple, on 2-bracted peduncle; stigmas 14. S. Afr.

æquilaterus: see *C. chilensis.*

chilensis (*M. chilense*). Trailing several ft.: lvs. fleshy-triangular, 2½ in. or less long: fls. rose-purple, diurnal, 2 in. or less broad, the petals 1 in. or less long, anthers yellow or yellowish. Coasts Ore., Calif., Chile, making a good sand-cover.—Heretofore known in N. Amer. as *M. æquilaterale*, but that name is properly a synonym of *C. æquilaterus*, an Australian plant not native in N. Amer. nor in cult.

edulis (*M. edule*). HOTTENTOT-FIG. Much like *C. chilensis* but parts larger: lvs. to 3 in. and more long: fls. yellow varying to rose-purple, opening wide, to 3 in. across, petals about 1½ in. long: fr. very large. S. Afr., planted and somewhat escaped in Calif.—Usually seen with yellow fls.: frequently grown under glass.

glaucescens (*M. glaucescens*). Similar to the other species: stouter than *C. chilensis*, with smoky-brown anthers: plant more or less glaucous: sts. stout, ¼ in. thick: lvs. 2 in. or less long and ¼ in. to nearly ½ in. thick near tip: fls. rose-purple. Australia.

CARPOCERAS: *Thlaspi.*

CARPODETUS. *Saxifragaceæ.* One New Zeal. shrub or small tree to 30 ft., intro. to cult. in Calif. **C. serratus.** Lvs. alternate, ovate-oblong, to 2 in. long, coarsely toothed, often lobed when young: fls. white, ⅕ in. across, in many-fld. panicles: caps. black and shining, globose, to ¼ in. diam.

CARRIEREA. *Flacourtiaceæ.* One or 2 deciduous trees native in Cent. China; one is planted in Calif. and has been fairly hardy in the S. E.; attractive for its foliage. Propagated by seeds and by cuttings of green wood and roots.

calycina. To 30 ft.: lvs. alternate, oval or ovate, to 6 in. long, toothed, shining: fls. diœcious, with white sepals ¾ in. long and no petals, in corymbs or racemes: fr. a caps. to 2½ in. long.

CARRION-FLOWER: *Smilax herbacea, Stapelia.*

CARROT (*Daucus Carota* var. *sativa*). Biennial or sometimes annual plant, grown for the thick edible root. It is an esteemed garden vegetable and also a farm crop raised for stock feed.

Carrots require deep friable soil for the largest and most shapely roots. They are hardy and easily grown. The extra-early varieties may be forced in a hotbed, or seed may be sown as soon as the ground is fit to work in the spring. The stump-rooted, or half-long varieties, are sown for the early garden crop. Well-enriched mellow loam, deeply dug or plowed, is best suited to the requirements of carrots. The seed for the main crop may be sown as late as July 15. Sow thickly, thinning to 3–4 inches in the row. The rows, if in a garden that is hand-worked, may be 12 inches apart. If the cultivation is by horse, the rows should be 2 to 3 feet apart. One ounce will sow 100 feet of drill. Seeds germinate slowly, and they should not be placed in land that is likely to become hard and crusted.

CARTHAMUS (*Kentrophyllum*). *Compositæ.* Spiny-lvd. stiff annuals with yellow, purple or whitish heads of disk-fls. subtended by leafy spiny involucres; pappus scale-like or lacking; native from the Canary Isls. to Cent. Asia. Cult. for ornament and for the dye obtained from the fls. of one species. Propagated by seeds.

lanatus. Ann. or bien. to 3 ft. high, sometimes cobwebby: root-lvs. lyrate, st.-lvs. lanceolate and spiny pinnatifid: heads yellow, 1 in. long. Medit. region.

leucocaulos. Glabrous: lvs. pinnatifid into lanceolate spiny segms., shining: heads pale rose. Greece.

tinctorius. Safflower. False Saffron. To 3 ft., glabrous: lvs. broadly ovate, minutely spiny-toothed: heads orange, 1 in. long, with broad short lower bracts. Asia.

CARUM. *Umbelliferæ.* Thick-rooted herbs with pinnately or ternately compound lvs., small white or yellow fls. in compound umbels, and somewhat compressed frs.; one species is grown for its seeds which are used as flavoring; it is of easy cult. in any garden soil. Propagated by seeds sown in spring.

Carvi. Caraway. Ann. or bien. to 2 ft.: lvs. pinnately cut into linear or thread-like segms.: fls. white. Eu.; nat. in N. Amer.

CARUMBIUM: *Homalanthus populifolius.*

CARYA (*Hicoria*). Hickory. *Juglandaceæ.* Deciduous monœcious trees, all but one native in N. Amer., with alternate odd-pinnate lvs., unisexual fls., the staminate borne in drooping catkins, and fr. a nut inclosed in a thick green husk which splits into 4 valves; grown for ornament, the edible nuts, and for the strong hard wood.

Any of the native hickories may be transferred to parks and private grounds. Hickories are of slow growth and not readily transplanted. Propagated by seeds stratified and sown in spring, by root-sprouts, or special varieties by grafting. For cultural detalis see *Hickory-Nut* and *Pecan.*

alba (*C. tomentosa*). Mockernut. To 90 ft.: lvs. of 7–9 oblong lfts. to 7 in. long, tomentose beneath: nut nearly globose, angled, light brown. Mass. to Fla. and Tex.

aquatica. Bitter Pecan. To 90 ft.: lvs. of 7–13 lanceolate lfts. to 5 in. long, yellow-tomentose when young: nut broad-obovoid, compressed and 4-angled, reddish-brown. Va. to Fla. and Tex.

cathayensis. Chinese H. To 60 ft.: lvs. of 5–7 ovate to ovate-lanceolate lfts. to 6 in. long, yellowish beneath: nut ovoid, slightly angled. China.

cordiformis. Bitternut. To 90 ft.: lvs. of 5–9 ovate-lanceolate to lanceolate lfts. to 6 in. long: nut almost globose, nearly smooth, gray. Que. to Fla. and La.

glabra (*C. porcina*). Pignut. Tree to 40 ft., with close not shaggy bark: lfts. mostly 5, oblong or somewhat oblanceolate, acuminate, serrate, to 6 in. long: nut obovoid and somewhat ridged, to 1 in. long, the kernel astringent. Me. and Ont. to Fla.

laciniosa (*C. sulcata*). Big Shellbark H. To 120 ft.: lvs. of 7–9 oblong-lanceolate lfts. to 8 in. long, pubescent beneath: nut nearly globose, compressed and angled, yellow or reddish. N. Y. to Okla.

ovata. Shagbark H. To 120 ft.: lvs. of usually 5 elliptic lfts. to 6 in. long: nut ellipsoid, slightly angled, white. Que. to Fla. and Tex.

Pecan. Pecan. To 150 ft.: lvs. of 11–17 oblong-lanceolate lfts. to 7 in. long: nut ovoid or oblong, smooth, light brown. Ind. to Mex.

porcina: *C. glabra.*

sulcata: *C. laciniosa.*

tomentosa: *C. alba.*

CARYOLOPHA: *Pentaglottis.*

CARYOPHYLLACEÆ. Pink Family. Herbs or sometimes subshrubs, of about 75 widely distributed genera, with sts. usually swollen at the joints, opposite entire lvs. with parallel veins, regular mostly bright-colored fls. having 4–5 sepals, commonly 4–5 petals, 8–10 stamens, superior 1-celled ovary with 2–5 styles, and fr. a caps. or rarely a berry. The family furnishes many flower-garden subjects, such as Acanthophyllum, Agrostemma, Arenaria, Cerastium, Dianthus, Gypsophila, Herniaria, Lychnis, Paronychia, Petrocoptis, Sagina, Saponaria, Silene, Spergula, Stellaria, Telephium, Tunica.

Most of the species are outdoor plants, but the carnation (*Dianthus Caryophyllus*) is extensively grown under glass for cut-flowers. Some of them are annuals, others essentially biennials, and many are good low perennials for borders. They are plants of simple culture, grown from seeds, cuttings and sometimes from layers and division of the stools. They require open sunny situations.

CARYOPHYLLUS: *Eugenia.*

CARYOPTERIS. Bluebeard. *Verbenaceæ.* Asian deciduous shrubs or herbs with opposite toothed lvs. and lavender or white fls. in cymes, the stamens exserted.

Grown in pots in the greenhouse in a compost of peat and loam. Not fully hardy out-doors in the North, but in the southern states may bloom from root shoots. Propagated by seeds in spring or by cuttings in autumn under glass.

incana (*C. Mastacanthus*). Shrub to 5 ft. but often dying back and treated essentially as a per. herb: lvs. ovate, to 3 in. long, grayish-tomentose beneath: fls. violet or lavender-blue, ¼ in. long, in autumn. China, Japan.—Sometimes called "blue spirea." Var. **candida** has white fls.

Mastacanthus: *C. incana.*

mongolica. Shrub: lvs. linear-lanceolate, to 2 in. long, nearly entire: fls. ½ in. long. N. China, Mongolia.

tangutica. Shrub to 5 ft.: lvs. lanceolate, toothed, tomentose beneath: fls. pink or bluish, small. China.

CARYOTA. Fish-tail Palms. *Palmaceæ.* Irregularly pinnate monœcious unarmed often soboliferous palms, perhaps 20 species, trop. Asia, Malaya to Australia, monocarpic (dying after fruiting): lvs. 2-pinnate or -pinnatisect, the pinnæ or lfts. broadly cuneate and widening upwards and variously jagged or lobed at apex and many-veined: spadices axillary, long and narrowly branched and mostly hanging, the staminate and pistillate blooming alternately from the top of the tree downward and the tree perishing when the bottom infl. has fruited; stamens many: fr. globose or short-oblong, ½–¾ in. diam. Attractive as tub specimens, and grown in the open in S. Fla. See *Palm*.

mitis (*C. sobolifera*). Soboliferous, trunks ringed, to 25 or 40 ft.: lvs. 4–9 ft. long and light green; pinnæ rather thin and with many light ribs or nerves, the toothed edge or end usually not occupying more than half the length and the outer margin produced into a short point: spadix not greatly elongated, the stamens 15–25. Burma.

Rumphiana. Trunk solitary, 60 ft. or more: lvs. to 20 ft. long; pinnæ very oblique and about half-fan-shaped, as much as 1 ft. and more long, rigid, obtusely toothed, the lower margin sometimes extended into a long obtuse lobe: spadix to 2 ft. and more; stamens more than 30. Malaya, Australia.

sobolifera: *C. mitis.*

urens. Wine Palm. Trunk solitary, to 60 ft.: lvs. to 20 ft. long and 10–15 ft. broad, dark green; pinnæ thick and rigid, strongly ribbed, lateral ones long-oblique so that the prominently toothed edge commonly occupies more than half the length, the outer margin mostly produced into a long finger-like lobe: spadix 10–12 ft. long, pendent; stamens 40 or more. India, Malaya.

CASCARA SAGRADA: *Rhamnus Purshiana.*

CASHEW: *Anacardium occidentale.*

CASIMIROA. *Rutaceæ.* Trop. American trees with leathery digitate lvs., small fls. in axillary panicles or corymbs, and fr. a large 2–5-seeded drupe; one species is grown in warm countries for its edible fruit.

The white sapote thrives on any well-drained soil. Propagated by seeds sown in flats or pots. Seedlings should not be planted out until about 3 feet high and should then receive liberal watering. The terminal bud should be pinched off to induce branching. For quick results and to reproduce special varieties, shield-budding should be practiced.

edulis. White Sapote. To 50 ft.: lvs. of 3–7 ovate to lanceolate lfts. to 5 in. long: fls. greenish: fr. 3–4 in. across, globular, smooth, yellowish-green, with soft cream-colored edible pulp bearing 3 or 4 seeds.

CASSABANANA: *Sicana odorifera.*

CASSANDRA: *Chamædaphne calyculata.*

CASSAVA: *Manihot esculenta.*

CASSENA: *Ilex vomitoria.*

CASSIA. Senna. *Leguminosæ.* A large genus, as commonly accepted, comprising herbs, shrubs and trees native in trop. and temp. regions, having pinnate lvs., showy nearly regular fls. often in large racemes, and flattened or cylindrical sometimes winged pods; grown for ornament, and many species of medicinal value for the senna lvs. used as a cathartic.

The woody species require a tropical climate and can be grown only under glass in the North. Propagated by division and cuttings. The herbaceous kinds may be grown in the border from seeds or division.

alata (*Herpetica alata*). Ringworm C. Shrub to 8 ft.: lvs. very large, of 12–28 oblong lfts. to 2½ in. long: fls. yellow, in spike-like racemes: pods winged, to 6 in. long. Tropics.

artemisioides. Wormwood S. Shrub covered with silky gray pubescence: lvs. of 6–8 linear needle-like lfts. to 1 in. long: fls. sulfur-yellow, in axillary racemes: pods flattened, to 3 in. long. Australia.

australis. Tall shrub: lvs. of 12–24 oblong-lanceolate to linear lfts. to 1 in. long: fls. yellow, in clusters of 2–6: pods to 4 in. long, often curved. Australia.

Beareana. Tree to 30 ft.: lvs. of 16–20 elliptic lfts. to 2 in. long: fls. canary-yellow, veined with red or brown, in short racemes: pods cylindrical, to 2½ ft. long. Trop. Afr.

cinerea (*Chamæcrista cinerea*). Shrub with ascending or prostrate sts. to 6 in. long: lvs. of 12–15 linear lfts. to ¼ in. long: fls. yellow, solitary or clustered: pods to 2 in long. Mex.

corymbosa (*C. floribunda*). Shrub to 10 ft.: lvs. of 6 oblong-lanceolate lfts.: fls. yellow, in axillary corymbs, blooming under glass from spring to autumn: pods cylindrical, 3 in. long. Argentina.—The commonest greenhouse species.

Fistula. Golden-Shower. Pudding-Pipe-Tree. Tree to 30 ft.: lvs. large, of 8–16 ovate lfts. to 2½ in. across: fls. pale yellow, in racemes 1 ft. or more long, blooming in spring before the lvs.: pods cylindrical, to 2 ft. long. India.

floribunda: *C. corymbosa.*

glauca. Tall shrub or tree: lvs. of 12–20 obovate lfts. about 1½ in. long: fls. bright yellow, in umbel-like racemes: pods flat, to 6 in. long. Trop. Asia.

grandiflora: *C. lævigata.*

grandis. Pink-Shower. Tree to 50 ft.: lvs. of 16–40 oblong lfts. to 2½ in. long, tomentose beneath: fls. rose-colored, in lateral racemes: pods somewhat flattened, to 2 ft. long. Trop. Amer.

javanica. Small tree: lvs. of many oval lfts. to 2 in. long: fls. rosy-pink: pods cylindrical, to 2 ft. long. Sumatra, Java.

lævigata (*C. grandiflora. Adipera lævigata*). Shrub to 6 ft.: lvs. of 6–8 ovate-lanceolate lfts. to 3 in. long: fls. yellow, in axillary racemes: pods cylindrical, to 3½ in. long. Tropics.

magnifica is referred to *C. multijuga.*

marilandica. Wild S. Per. herb to 4 ft.: lvs. of 10–20 oblong lfts. to 2 in. long: fls. yellow, in axillary racemes: pods linear, flat, to 4 in. long. E. U. S.

moschata. Tree to 30 ft. and more: lvs. of 10 or more pairs of oblong lfts. pubescent beneath: fls. yellow or orange-red, 1 in. across, in drooping racemes to 8 in. long: pods cylindrical. Trop. Amer.

multijuga. Tree to 20 ft.: lvs. of 18–40 pairs of linear-oblong lfts. to ¾ in. long: fls. yellow, to 2 in. across: pods flattened, 6 in. long. S. Amer., W. Indies.

nairobensis. Shrub to 10 ft.: lvs. of numerous oblong lfts. to 2 in. long: fls. yellow, 1½ in. across, in racemes: pods flattened, 4 in. or more long. Afr.

nodosa. Jointwood. Tree to 50 ft.: lvs. of 12-24 oblong lfts. to 4 in. long: fls. bright pink, in dense racemes: pods cylindrical, to 15 in. long. E. Himalayas to Malaya.

pilifera. Herb or subshrub to 6 ft.: lvs. of 4 ovate lfts.: fls. 1 in. across, petals contracted into long claw. Brazil.

polyantha. Shrub or small tree to 18 ft.: lvs. of 16–28 elliptic-oblong lfts. to ¾ in. long: fls. yellow: pods flattened, winged, about 2½ in. long. Mex.

Roemeriana. Per. to 1½ ft.: lvs. of 2 linear-lanceolate lfts. to 2½ in. long: fls. orange-yellow, in terminal corymbose racemes: pods about 1 in. long. Tex. to Mex.

siamea. Kassod Tree. Tree to 40 ft.: lvs. of 16–18 oblong lfts. to 3 in. long: fls. bright yellow, in corymbs forming a large terminal panicle: pods flat, to 9 in. long. E. Indies and Malaya.

spectabilis. Tree to 40 ft.: lvs. of 8–15 pairs of lanceolate lfts. to 3 in. long: fls. bright yellow, 1½ in. across, in racemes to 2 ft. long: pods cylindrical, 1 ft. long. Trop. Amer.

splendida. Shrub to 10 ft.: lvs. of 4 oval to oblong lfts. to 3 in. long: fls. yellow, large, in panicled racemes: pods nearly cylindrical, to 1½ in. long. Brazil.

tomentosa. Shrub to 12 ft.: lvs. of 12–16 oblong lfts. to 2½ in. long, white-tomentose beneath: fls. deep yellow: pods flattened, to 5 in. long. Mex.

CASSIA-BARK-TREE: *Cinnamomum Cassia.* **-Flower-Tree**: *Cinnamomum Loureirii.*

CASSIE: *Acacia Farnesiana.*

CASSINIA. *Compositæ.* Evergreen shrubs native in Australia, New Zeal. and S. Afr., with alternate entire lvs. and small heads of disk-fls. borne in corymbs or panicles; pappus bristly. A few species are grown out-of-doors in Calif.

albida: *C. Vauvilliersii* var.

aurea. Lvs. linear-lanceolate, to 2 in. long, glandular beneath, glabrous above: heads in compound corymbs; scales with bright yellow tips. Australia.

fulvida. To 6 ft.: lvs. crowded, to ⅓ in. long, yellowish-tomentose beneath, sticky above: heads white, in dense corymbs to 2 in. across; scales lacking or few among the florets. New Zeal.

leptophylla. To 15 ft.: lvs. crowded, to ⅛ in. long, white- or yellowish-tomentose beneath: heads white, in terminal corymbs; scales many among florets. New Zeal.

Vauvilliersii. To 6 ft.: lvs. crowded, ⅓ in. long, white- or yellowish-tomentose beneath, sticky above: heads white, in terminal corymbs; scales many among florets. New Zeal. Var. **albida** (*C. albida*) has lvs. whitish beneath.

CASTALIA: *Nymphæa.*

CASTANEA. Chestnut. *Fagaceæ.* Attractive hardy deciduous trees and shrubs of the north temp. zone, having alternate, toothed, oblong or lanceolate lvs., unisexual fls. in catkins, and 1–7 large brown nuts inclosed in a prickly dehiscent involucre or bur; grown for ornament and the edible nuts. For cult. see *Chestnut.* See also *Bertholletia.*

americana: *C. dentata.*

crenata (*C. japonica*). Japanese C. To 30 ft.: lvs. to 6 in. long, closely toothed with sinuses between, commonly tomentose beneath: nuts usually 2–3, about 1 in. across. Japan.

dentata (*C. americana*). American C. To 100 ft.: lvs. to 10 in. long, coarsely toothed, glabrous beneath, mostly tapering or narrow at base: nuts usually 2–3, 1 in. or less across. Me. to Miss.

japonica: *C. crenata.*

mollissima. Chinese C. To 60 ft.: lvs. to 6 in. long, coarsely toothed, pubescent beneath: nuts usually 2–3, about 1 in. across. China, Korea.

pumila. Chinquapin. Shrub or tree to 45 ft.: lvs. to 5 in. long, coarsely toothed, white-tomentose beneath: nut usually solitary, ½ in. or less across. Pa. to Fla. and Tex.

sativa (*C. vesca*). Spanish or Eurasian C. To 100 ft.: lvs. to 8 in. long, with coarse spreading teeth, pubescent beneath when young, mostly rounded or broad at base: nuts 1–3, 1 in. or more across. S. Eu., N. Afr., W. Asia.—There are forms with variegated lvs., and var. **asplenifolia** has lobed and abnormal lvs.

vesca: *C. sativa.*

CASTANOPSIS. *Fagaceæ.* Evergreen trees and shrubs native in Asia and W. N. Amer., with alternate entire or dentate lvs., unisexual fls. usually in separate catkins, and 1–3 nuts inclosed in a spiny or tubercled involucre; not hardy in cold climates. Cult. as for *Chestnut,* which see.

chrysophylla. Giant Chinquapin. To 100 ft. or more although sometimes shrub-like: lvs. oblong, to 6 in. long, entire, shining dark green above and with golden-yellow scales beneath: fr. with spiny husk. Ore., Calif., Nev. Var. **sempervirens** (*C. sempervirens*) is a shrubby form.

cuspidata (*Quercus cuspidata*). Lvs. ovate or oblong, to 3 in. long, entire or toothed toward tip, gray-tomentose beneath: fr. with tubercled husk. Japan.

sclerophylla. Lvs. oblong-ovate, to 6 in. long, toothed above middle: fr. with tubercled husk. China.

sempervirens: *C. chrysophylla* var.

CASTANOSPERMUM. *Leguminosæ.* Two species, only one from Australia planted in trop. and semi-trop. regions. C. australe. Moreton-Bay-Chestnut. Black Bean. Evergreen tree to 60 ft. with large pinnate lvs. composed of 11–15 broadly oblong lfts. to 5 in. long, striking yellow to orange and reddish papilionaceous long-stamened fls. in racemes to 6 in. long, and cylindrical pods to 9 in. long.—Propagated by seeds; the latter are eaten by the natives of Australia.

CASTILLA (*Castilloa*). *Moraceæ.* Trop. American trees with milky juice from which commercial rubber is obtained, having large alternate lvs. and unisexual fls. in dense heads.

Propagated by seeds and the seedlings should be transplanted to a permanent position when about 1 foot high. Trees are ready for tapping at about eight years old.

elastica. Mexican Rubber-Tree. To 60 ft.: lvs. elliptic-obovate, to 1½ ft. long, densely pubescent beneath, short-stalked. Mex., Cent. Amer., N. S. Amer.

CASTILLEJA. Painted-Cup. *Scrophulariaceæ.* Herbs usually parasitic on roots of other plants, ann., bien., per., with narrow alternate lvs., small 2-lipped tubular fls. in terminal gaudy-bracted heads or spikes; mostly native in western hemisphere, many of them in U. S. They are seldom grown in the garden or transferred from the wild.

affinis. Per. to 2 ft : lvs. linear to lanceolate, to 4 in. long: fls.-bracts scarlet, fls. yellowish, 1¼ in. long. Calif.

californica. Indian Paint-Brush. Per., slender, to 1½ ft.: lvs. linear, to 1½ in. long: fl.-bracts red or red-tipped, fls. bright red, the tube greenish-yellow, 1 in. long. Calif.

coccinea. Scarlet P. Ann. or bien. to 2 ft., hairy: lvs. oblong to linear, to 3 in. long, st.-lvs. 3–5-lobed: fl.-bracts scarlet, fls. pale yellow, to 1 in. long. Me. to N. C. and Tex.

foliolosa. Woolly P. Per., white-woolly, to 1½ ft., base woody: lvs. linear, 1 in. long: fls. yellowish or greenish, ¾ in. long. Calif.

indivisa. Texas P. Ann. to 2 ft.: lvs. linear or linear-lanceolate, to 4 in. long: bracts bright red, calyx red and about length of corolla. Tex.

integra. Per. to 1 ft., tomentose: lvs. narrow-linear, to 3 in. long: fl.-bracts crimson, pink or yellowish, fls. green bordered with crimson, 1 in. long. Colo. to Mex.

latifolia. Per., viscid-pubescent, to 1½ ft.: lvs. thick, mostly oval or obovate, to 1 in. long (usually shorter), the upper ones sometimes 3-lobed at apex: fls. in leafy spike, the bracts yellow or red· corolla about ¾ in. long. Calif.

Martini. Per. with woody decumbent base, branches ascending, sticky-hairy: lvs. linear, 1 in. long: bracts scarlet-tipped, fls. reddish, 1 in. long. Calif.

parviflora. To 2 ft., hairy: lvs. cut into lanceolate or linear segms., or the upper ones entire: corolla about 1 in. long, the bracts red, yellow to white. Colo., Calif. and elsewhere.—Variable.

rhexifolia. Per. to 2 ft.: lvs. oblong-lanceolate to ovate, 2 in. long: fl.-bracts scarlet or rose, fls. green bordered with scarlet, 1 in. long. Rocky Mts.

sulphurea. Per. to 1½ ft.: lvs. lanceolate to ovate, 2 in. long: fl.-bracts light yellow, fls. greenish, 1 in. long. Rocky Mts.

CASTILLOA: *Castilla.*

CASTOR-OIL PLANT: *Ricinus communis.*

CASUARINA. Beefwood. She-Oak. Australian-Pine. *Casuarinaceæ.* Hard-wooded trees or shrubs native in Australia and Pacific Isls., having jointed branches resembling the horsetail or equisetum, lvs. reduced to minute scales or teeth, unisexual fls., the staminate borne in spikes and the pistillate in dense heads becoming dry cones in fr.

Casuarinas are much planted as avenue trees in Florida and other warm regions; they do well near salt water. Propagated by cuttings of half-ripened wood, and also by seeds.

Cunninghamiana. To 70 ft.: cones globular, ⅓ in. or less across, with glabrous valves: teeth on branchlets 8–10.

distyla. Shrub or small tree: cones oblong, to 1 in. long, the valves with dorsal protuberance: teeth on branchlets usually 6.

equisetifolia. Horsetail-Tree. To 70 ft., the branches drooping: cones globular, ½ in. across, with pubescent valves: teeth on branchlets commonly 7. Nat. in Fla.

glauca. To 50 ft., glaucous: cones globular, ½ in. across: teeth on branchlets about 16.

horrida. Shrub to 9 ft. with erect stiff branches: cones nearly globular, about ½ in. across, bristly: teeth on branchlets 10 or 12.

quadrivalvis: *C. stricta.*

stricta (*C. quadrivalvis*). To 30 ft., the branches drooping: cones globular or ovoid, 1 in. or more across: teeth on branchlets about 10.

suberosa. To 50 ft.: cones cylindrical-oblong, ½ in. across: teeth on branchlets 6–8.

CASUARINACEÆ. Casuarina Family. Only one genus, trees or tree-like, Casuarina which is employed for ornamental planting in Calif., Fla. and other southern parts.

CATALPA. *Bignoniaceæ.* Trees with large simple long-stalked lvs., mostly deciduous, bell-shaped irregular white, whitish or rose-colored fls. in terminal panicles or racemes, and fr. a long narrow caps. 1 ft. or more long; native in N. Amer. and E. Asia.

Catalpas are popular lawn and avenue trees and mostly hardy North, very showy when in bloom in late spring and early summer; sometimes planted for small timber. They do well in any good soil. Propagated by seeds in spring and cuttings of mature wood; also by layers, root-cuttings, cuttings of young wood in early summer, and named varieties by grafting on seedlings or cuttings of young trees.

bignonioides (*C. syringæfolia. C. cordifolia*). Common C. Indian-Bean. To 60 ft.: lvs. ovate, to 8 in. long, abruptly short-acuminate, pubescent beneath: fls. white with 2 yellow stripes and brown spotted, 2 in. across, in panicles 8 in. long. Ga. to Fla. and Miss. Var. **aurea** has yellow lvs. and var. **nana** is dwarf.

Bungei. Small tree: lvs. triangular-ovate, to 6 in. long, long-acuminate, sometimes toothed or angled near base, glabrous: fls. white spotted purple, 1½ in. long. China.—This name is often applied to *C. bignonioides* var. *nana.*

chinensis: a listed name.

cordifolia: *C. bignonioides.*

Duclouxii. To 80 ft.: lvs. ovate, to 8 in. long, acuminate, glabrous: fls. rose marked with orange, 1½ in. long. China.

Fargesi. To 60 ft.: lvs. ovate, to 6 in. long, long-acuminate, densely pubescent beneath, 3-lobed on young plants: fls. pink or purplish spotted with brown, 1½ in. long. China.

hybrida (*C. Teasii*). Hybrid between *C. bignonioides* and *C. ovata*, intermediate in character: lvs. larger than in *C. ovata*, mostly purplish when young, sometimes angled or shallowly lobed: fls. resembling *C. bignonioides* but smaller. Much planted.

Kaempferi: *C. ovata.*

ovata (*C. Kaempferi*). To 30 ft. or more: lvs. broad-ovate, sometimes 3–5-lobed, to 10 in. long, abruptly acuminate, pubescent on veins beneath: fls. yellowish-white marked with orange and violet, to ¾ in. long, in panicles to 10 in. long. China.

speciosa. Western C. To 100 ft.: lvs. ovate, to 1 ft. long, long-acuminate, densely pubescent beneath: fls. white spotted with brown, 2½ in. across, in panicles 6 in. long. Ill. to Ark.

syringæfolia: *C. bignonioides.*

Teasii: *C. hybrida.*

CATANANCHE. Cupids-Dart. *Compositæ.* Herbaceous annuals and perennials with narrow lvs. borne near base of st. and long-stalked blue or yellow heads of ray- and disk-fls. and chaffy involucre; pappus of bristles or scales; native to Medit. region.

One is cultivated in the flower-garden and as an everlasting. It grows well in the average garden soil and under the usual treatment for perennials. Raised from seed sown in spring and blooming the same year; also by division.

cærulea. Per. to 2 ft., blooming first year from seed: lvs. lanceolate, few-toothed, tomentose: heads 2 in. across, ray-fls. blue, involucre chaff-like, June–Aug. S. Eu. Var. **alba** has white rays and bicolor blue rays edged with white.

CATASETUM. *Orchidaceæ.* Trop. American terrestrial or epiphytic orchids, having pseudobulbs bearing 2–4 plaited lvs., polygamous fls. of 3 different forms borne in racemes, the pollen-masses flying out when the appendages of the column are touched; cult. in the hothouse, commonly suspended and given a resting period. See *Orchids.*

Bungerothii: *C. pileatum.*

callosum. Fls. in 10–15-fld. racemes to 1 ft. high; sepals and petals brown, about 2 in. long; lip green spotted with red, shortly saccate at base, Dec. Venezuela, Colombia.

macrocarpum. Fls. in 4–10-fld. racemes to 1½ ft. high; sepals and petals greenish spotted with red, 1–2 in. long; lip yellow, Oct.–Dec. Trop. Amer.

maculatum. Fls. in 6–12-fld. racemes to 14 in. high; sepals and petals bright green tinged with red, about 2 in. long; lip green spotted outside with brown, Sept.–Oct. Guatemala, Venezuela.

medium. Fls. small, in many-fld. racemes; sepals and petals greenish-yellow barred with brown; lip yellowish. Habitat unknown.

pileatum (*C. Bungerothii*). Fls. in 4–8-fld. racemes to 1 ft. high; sepals and petals bright yellow, 2 in. long; lip yellow with a short sac at base orange-red within, Oct. Venezuela.

scurra. Fls. pale straw-color, in drooping racemes, fragrant, the lip with the 2 fringed side lobes and the middle lobe consisting of a broad stalk with fringed edges. Guiana.

CAT-BRIER: *Smilax glauca.*

CATCHFLY: *Silene.* **German:** *Lychnis Viscaria.*

CATESBÆA. *Rubiaceæ.* W. Indian spiny shrubs or small trees with opposite or whorled lvs., white, funnelform or campanulate, 4-lobed, solitary fls., and fr. a white berry; one species grown in S. Fla. and other warm regions.

spinosa. Lily-Thorn. To 15 ft., with spines 1 in. or more long: lvs. ovate, to 1 in. long: fls. creamy, to 6 in. long, much exceeding the small lvs.:berries to 2 in. long. Cuba, Bahamas.

CATHA. *Celastraceæ.* An evergreen shrub native from Abyssinia to S. Afr., the lvs. much used by the Arabs in the preparation of a drink. **C. edulis.** Khat. Cafta. To 10 ft.: lvs. opposite, sometimes alternate on infertile shoots, oval, to 4 in. long, toothed: fls. small, white, in axillary clusters: fr. a 3-angled caps., about ¼ in. long.—Planted in S. Fla. and Calif., and also sometimes under glass for its economic interest. See *Gymnosporia.*

CATHARTOLINUM: *Linum.*

CATHCARTIA. *Papaveraceæ.* Per. low poppy-like herbs with yellow juice, native in Cent. Asia: lvs. lobed or wavy: fls. showy, long-stalked and solitary or in few-fld. cymes:

probably only one species differing from Meconopsis in characters of caps. and stigmas.

betonicifolia: *Meconopsis betonicifolia.*

villosa. To 1 ft., tomentose: basal lvs. cordate-ovate, 3–5-lobed and the lobes cut, long-stalked: fls. yellow, 2 in. across, in cymes: caps. to 2½ in. long. Himalayas.

CATJANG: *Vigna Catjang.*

CATKIN: a scaly-bracted spike with unisexual flowers; ament; prominent in willows and poplars.

CATMINT: *Nepeta Cataria.*

CATNEP, CATNIP: *Nepeta Cataria.*

CATS-CLAW: *Doxantha Unguis-cati, Pithecellobium Unguis-cati.*

CATS-EAR: *Calochortus cæruleus, Hypochæris.*

CAT-TAIL: *Typha.* **Redhot**: *Acalypha hispida.*

CATTLEYA. *Orchidaceæ.* Epiphytes native in trop. Amer., having pseudobulbs with 1–3 very thick lvs. and fls. in terminal clusters or rarely solitary, the sepals similar, the petals broader, lip of 2 lateral lobes which form a tube around the column, and spreading middle lobe; require intermediate temperatures. See *Orchids* for cult. There are large numbers of hybrids and hort. forms; popular orchids grown in the intermediate house.

Aclandiæ. Pseudobulbs 3 in. long, with 2 broadly elliptic lvs. to 2 in. long: fls. to 4 in. across, 1 or 2 together; sepals and petals yellowish-green spotted with purple-brown; lip with short red side lobes and magenta wavy middle lobe, June–July. Brazil.

amabilis. Hybrid between *C. labiata* and *C. Warscewiczii.*

amethystoglossa. Lvs. broadly lanceolate, to 8 in. long: fls. 3 in. across, 5–8 together; sepals and petals white suffused with rose and spotted with violet; lip with whitish side lobes and bluish-violet middle lobe, Feb.–June. Brazil.

armainvillierensis. Hybrid between *C. Mendelii* and *C. Warscewiczii.*

Armstrongiæ. Hybrid between *C. Hardyana* and *C. Harrisoniana.*

aurantiaca (*Epidendrum aurantiacum*). Fls. orange-red, 3 in. across, July–Aug. Mex., Guatemala.

aurea: *C. Dowiana* var.

Ballantineana. Hybrid between *C. Trianæi* and *C. Warscewiczii.*

Bertii. Hybrid between *C. Harrisoniana* and *C. labiata.*

Beyrodtiana: *C. labiata* var.

bicolor. Lvs. oblong-lanceolate, to 6 in. long: fls. to 4 in. across, 2 together; sepals and petals bronze-green; lip rose edged with gold, toothed, without side lobes, Sept.–Nov. Brazil.

Blackii. Hybrid between *C. Gaskelliana* and *C. Mendelii.*

Bowringiana. Lvs. broadly lanceolate, to 6 in. long: fls. 3 in. across, 5–12 together; sepals and petals rose-violet; lip rose, lilac within, yellow in throat, Sept.–Dec. Honduras.

Cappei alba. Hybrid between *C. Trianæi* var. *Schroederiana* and var. *alba.*

chocoensis: *C. Trianæi* var.

chrysotoxa: *C. Dowiana.*

citrina. Lvs. strap-shaped, to 8 in. long: fls. citron-yellow, solitary on drooping stalks slightly longer than lvs., the lip white on edges and wavy, Oct.–Apr. Mex.

Clarkiæ. Hybrid between *C. labiata* and *C. bicolor.*

Cooksoni. Hybrid between *C. Hardyana* and *C. Trianæi.*

Dowiana (*C. labiata* var. *Dowiana. C. chrysotoxa*). Lvs. to 1 ft. long: fls. to 7 in. across, 2–5 together; sepals and petals nankeen-yellow; lip with yellow tube striped with purple and wavy purple limb lined with gold, July–Sept. Costa Rica. Var. **aurea** (*C. aurea*). Lip with more and deeper yellow lines. Var. **rosita** has creamy-white sepals tinged with purple, and rose-purple petals tinged with yellow.

Dupreana. Hybrid between *C. Warneri* and *C. Warscewiczii.*

Dusseldorfi. Hybrid between *C. intermedia* var. *alba* and *C. Mossiæ* var *alba.*

Edwardi. Hybrid between *C. Schilleriana* and *C. Warscewiczii.*

Eldorado. Pseudobulbs to 8 in., 1-lvd., stout: lvs. oblong, to 12 in.: fls. fragrant, to 6 in. across, pale rosy-lilac shading to white; lip crisped, centrally blotched orange and purple. Brazil.

elongata. Lvs. elliptic, to 6 in. long: fls. 3 in. across, 2–8 together; sepals and petals red-brown; lip rose, darker lined in throat, wavy-margined, May. Brazil.

Fernandi. Hybrid between *C. Warscewiczii* and *C. Aclandiæ.*

Forbesii. Lvs. elliptic, to 5 in. long: fls. to 4 in. across, 1–5 together; sepals and petals olive- or yellow-green; lip white outside, yellow inside marked with red, the limb wavy, June–Sept. Brazil.

Gaskelliana (*C. labiata* var. *Gaskelliana*). Lvs. oblong, to 1 ft. long: fls. to 7 in. across, 2–3 together; petals and sepals purple-violet suffused with white; lip purple-violet with a yellow streaked throat, wavy, June–Nov. Venezuela. Var. **alba** has pure white sepals and petals, creamy-white lip with yellow throat. Var. **cærulea** has pure white fls. with bluish spot on base of lip.

gigas: *C. Warscewiczii* var.

granulosa. Lvs. lanceolate-oblong, to 6 in. long: fls. to 4 in. across, 5–8 together; sepals and petals olive-green spotted with brown; lip white dotted with purple, the claw yellow marked with red, wavy, Aug.–Sept. Guatemala.

guttata. Lvs. oblong-elliptic, to 9 in. long: fls. to 4 in. across, 10–25 together; sepals and petals green spotted with red; lip with rose or white side lobes and white limb spotted with violet, Oct.–Nov. Brazil.

Hardyana. Hybrid between *C. Dowiana* and *C. Warscewiczii.*

Harrisoniana. Lvs. oblong-lanceolate, to 6 in. long: fls. to 4 in. across, 2–5 together, rose-lilac, the middle lobe of lip purple with yellow spot, July–Oct. Brazil.

Hassellii. Hybrid between *C. labiata* and Empress Frederick.

Heloisiæ. Hybrid between *C. Forbesii* and *C. Mossiæ.*

intermedia. Lvs. oblong, to 6 in. long: fls. to 5 in. across, 3–7 together, pale rose with middle lobe of lip purple and wavy, May–June. Brazil. Var. **alba** has pure white fls.

iridescens. Hybrid between *C. Eldorado* and *C. bicolor.*

Kienastiana. Hybrid between *C. Dowiana* and *C. Lueddemanniana.*

labiata. Lvs. oblong, to 10 in. long: fls. to 6 in. across, 2–5 together, rose-lilac, the very wavy limb of lip violet-purple with deeper streaks and yellow throat, June–Nov. Trinidad, Brazil. Var. **alba** has white fls. with a yellow throat. Var. **Cooksoniæ** has white fls. with crimson-purple lip edged with white. Var. **Beyrodtiana** has yellow lip streaked with purple. Var. **Amesiana** has white fls. with lilac lip.

Lawrenceana. Lvs. oblong, to 9 in. long: fls. to 5 in. across, 5–7 together, rose-purple, the limb of lip purple with a maroon band, Mar.–Apr. British Guiana.

Leopoldii (*C. guttata* var. *Leopoldii*). Lvs. oblong-elliptic, to 8 in. long: fls. to 4 in. across, 10–25 together; sepals and petals brown dotted with red; lip purple, wavy, Oct.–Nov. Brazil.

lobata: *Lælia Boothiana.*

Loddigesii. Pseudobulbs to 12 in., 2-lvd., cylindric: lvs. oblong, to 5 in.: fls. to 4 in. or more across, rose-lilac, the lip 3-lobed and crisped and yellow at base. Brazil.

Lueddemanniana (*C. labiata* var. *Lueddemanniana. C. speciosissima*). Lvs. oblong, to 10 in. long: fls. to 6 in. across, 2–5 together, rose-purple, the lip with wavy amethyst-purple limb, throat spotted with yellow or white, July–Sept. Brazil. Var. **alba** has white fls. In var. **Stanleyi** the white fls. have the limb lined with purple.

luteola. Lvs. oblong-elliptic, to 4 in. long: fls. to 2 in. across, 2–5 together, citron-yellow, the middle lobe of lip white and wavy, Nov.–Dec. Brazil.

Mantini. Hybrid between *C. Bowringiana* and *C. Dowiana* var. *aurea.*

Maroni. Hybrid between *C. Dowiana* and *C. velutina.*

maxima. Lvs. oblong, to 10 in. long: fls. to 5 in. across, 3–8 together, lilac or pale rose, the limb of lip dark purple with orange-yellow markings, wavy, Oct.–Jan. Colombia.

McMastersiæ. Hybrid between *C. Schilleriana* and *C. Mendelii.*

Mendelii (*C. labiata* var. *Mendelii*). Lvs. oblong, to 10 in. long: fls. 8 in. across, 2–3 together, white or rosy, the limb of lip very wavy, purple with yellow throat, June–Nov. Colombia.

Minucia. Hybrid between *C. Loddigesii* and *C. Warscewiczii.*

Mossiæ. Lvs. oblong, to 8 in. long: fls. to 8 in. across, 3–5 together, rose, the very wavy lip with purple limb variegated with violet and edged with white, the throat yellow, Apr.–July. Venezuela. Var. **alba** has white fls. In var. **cærulea** the sepals and petals are blue-violet and also spot on lip. Var. **Reineckiana** has white fls. with yellow throat and violet limb. Var. **Wageneri** has white fls. with yellow spot on lip.

Murrayi. Hybrid between *C. Mendelii* and *C. Lawrenceana.*

Peetersi. Hybrid between *C. Hardyana* and *C. labiata.*

Percivalliana (*C. labiata* var. *Percivalliana*). Similar to *C. Mossiæ* but with smaller somewhat darker colored fls., Jan.–Mar. Venezuela.

Pittiana. Hybrid between *C. Dowiana* and *C. granulosa.*

Rafaeliæ. Hybrid between *C. Dowiana* and *C. Trianæi.*

Rex. Lvs. oblong, to 1 ft. long: fls. to 7 in. across, 3–6 together; sepals and petals white; lip yellow with crimson limb edged with white, wavy, July–Aug. Peru.

Roehrsiana. Hybrid between *C. Hardyana* and *C. Mendelii.*

Rothschildiana. Hybrid between *C. Dowiana* and *C. Gaskelliana.*

Sanderiana: *C. Warscewiczii* var. *gigas.*

Schilleriana. Lvs. elliptic, to 5 in. long: fls. to 4 in. across, 1–2 together; sepals and petals green spotted with brown; lip crimson with wavy limb and yellow throat, July–Sept. Brazil.

Schroederiana: *C. Trianæi* var.

Skinneri. Lvs. elliptic, to 6 in. long: fls. to 4 in. across, 4–6 together, rose-purple with yellow throat, Mar.–June. Guatemala. Var. **alba** has white fls.

speciosissima: *C. Lueddemanniana.*

Stuarti. Hybrid between *C. Mendelii* and *C. Mossiæ.*

suavior. Hybrid between *C. Mendelii* and *C. intermedia.*

superba: *C. violacea.*

Thayeriana. Hybrid between *C. intermedia* and *C. Trianæi* var. *Schroederiana.*

Thurgoodiana. Hybrid between *C. Hardyana* and *C. Lueddemanniana.*

Trianæi (*C. labiata* var. *Trianæi*). Lvs. oblong, to 8 in. long: fls. to 7 in. across, 2–3 together, rose, the lip with dark purple wavy limb and yellow throat, Dec.–Feb. Colombia. Var. **alba** has white fls. and **atropurpurea** crimson-purple. Var. **Backhousiana** has rose-purple sepals and petals with darker spot at tip. Var. **chocoensis** has fragrant white fls. sometimes tinged pale lilac. Var. **Schroederiana** has fragrant pink fls. with very wavy limb. Forms of this var. are *alba, cærulea, citrina* and *refulgens.*

velutina. Lvs. elliptic, to 6 in. long: fls. to 4 in. across, 4–7 together, fragrant; sepals and petals orange-yellow spotted with purple; lip whitish with purple lines, throat yellow, May–July. Brazil.

violacea (*C. superba*). Lvs. elliptic, to 5 in. long: fls. 5½ in. across, 3–7 together, fragrant; sepals and petals rose-purple; lip deep purple, the throat with a band of yellow, June–Aug. British Guiana.

Warneri (*C. labiata* var. *Warneri*). Lvs. oblong, to 7 in. long: fls. to 8 in. across, 3–5 together, rosy with limb of lip carmine and very wavy, the throat yellow, June–Aug. Brazil. In var. **alba** the fls. are white except the yellow throat.

Wavriniana. Hybrid between *C. granulosa* and *C. Warscewiczii.*

Warscewiczii (*C. labiata* var. *Warscewiczii*). Lvs. oblong, to 10 in. long: fls. to 8 in. across, 2–3 together; sepals and petals violet-rose; lip deep purple with 2 yellow spots in throat, wavy, Jan.–Apr. Colombia. Var. **gigas** (*C. Sanderiana*) has fls. larger. Forms of this var. are *alba* with pure white fls. and *rochellensis* with white fls. having lip tinged with color.

Wendlandiana. Hybrid between *C. Bowringiana* and *C. Warscewiczii.*

Wigani. Hybrid between *C. Dowiana* and *C. Schilleriana.*

Williamsiæ. Hybrid between *C. Gaskelliana* and *C. Harrisoniana.*

CAUDOXALIS: *Oxalis Bowieana.*

CAULESCENT: more or less stemmed or stem-bearing; having an evident stem above ground.

CAULIFLOWER, BROCCOLI (*Brassica oleracea* var. *botrytis*). Biennial plants (running to seed the second year) of the cabbage tribe but more tender to frost and untoward conditions, the edible part being a head formed of the condensed and thickened malformed flower-cluster rather than an aggregation of leaves. If the old plant is set out the following year, good flowering and seed-bearing shoots will arise from the stump and from such parts of the head as may not have been removed, as in the cabbage.

Cauliflower is not as cosmopolitan as to conditions as cabbage, or as easy to grow. It does best in a rather cool moist soil and under equable conditions; only highly selected seed should be used; the plant must be kept in a continuous state of thrift. Insects and diseases must be kept under full control; they are the same as the pests of cabbage.

The great heats and dryness of midsummer are to be avoided as far as possible at heading time, if the crop is to be grown in untoward regions. To this end, very early varieties may be grown, starting them under glass and harvesting the crop in June or early summer. The plants are handled as are cabbages, and the distances for the early varieties may be 24 inches or less in the row. For the late or main crop, seeds may be sown in seed-beds in late spring or early summer, and as these varieties make bigger plants the distances should be 2 feet in the row or even more for the larger kinds. Far South the crop may be grown for early spring use from seeds sown in autumn. Wherever irrigation is available, many of the difficulties of cauliflower growing may be overcome. About 1 ounce of seed is required for 1,000 plants.

A continuous steady growth from high-class seeds and well-grown plants should produce a solid head of regular shape, without "buttons" or breaks or straggling branches. To whiten the head, the outer leaves are sometimes tied together over it, but openings should be left on the sides for ventilation or the head may decay from the accumulation of moisture. Heads should be harvested as fast as they mature or they may crack or become discolored or develop decayed spots. In harvesting, a good circle of leaves should go with the head, and these leaves are trimmed a little above the head to serve as a protection, and to provide a cup in which the head sits attractively.

A race of very late large cauliflower is known as broccoli; the culture is in general the same as for the ordinary cauliflower except that it requires the entire season in which to grow; in mild climates it may be left in the field over winter, maturing its heads in spring. The Asparagus or Sprouting broccoli, Calabrese, is a different plant, *Brassica oleracea* var. *italica* (or var. *asparagoides*). It does not produce a thick solid white head but rather a small greenish head on the main stalk and similar heads on thick branches after the first head is cut; all these shoots are edible and are prized by those who know them; plants are usually allowed to stand over winter in mild climates where it is chiefly grown and the shoots are produced in the spring, the stock being one year old. It may be started early in plant beds and brought to maturity in late spring or in autumn of the same year. All the broccolis are specially prized by Italians.

Another plant sometimes but erroneously known as broccoli or "Italian kale" is the Seven-top turnip; see *Turnip*.

CAULINE: pertaining or belonging to the stem.

CAULOPHYLLUM. *Berberidaceæ.* Two erect per. rhizomatous herbs, one in E. N. Amer., and one in E. Asia, the former sometimes planted in the wild-garden or border. The genus is distinguished by the naked seeds left by the bursting of the pericarp and which become blue and berry-like. Fls. small, in a cluster, with the young ternately compound rue-like lvs.

thalictroides. Blue Cohosh. To 3 ft.: fls. yellow-green, about ½ in. across, in early spring: fr. ornamental, ⅓ in. across. Deep woods; requires shade.—The Asian *C. robustum* (sometimes considered a var. of the American plant) has less deeply toothed and more pointed lfts.

CEANOTHUS. *Rhamnaceæ.* N. American shrubs, particularly on the Pacific Coast, or small trees, with simple deciduous or persistent lvs., mostly showy blue or white small fls. in dense panicles or racemes, and 3-lobed capsular fr.; furnishes many ornamental subjects, among them many hybrids of European origin and giving rise to named hort. vars. The Pacific species and their derivatives are not hardy in the northeastern states. The following species are mostly deciduous.

Ceanothus thrives best in light well-drained soil in sunny positions. Few species are hardy North and plants may be dug in fall, stored in a frost-proof place, and set out again in spring. Propagated by seeds sown in spring, layers, and varieties by grafting on roots of *C. americanus* in spring under glass; also by cuttings of mature wood in autumn or soft-wood cuttings in spring from forced plants. Those native in the eastern parts of the country are sometimes transferred to grounds in that region.

americanus. New-Jersey-Tea. To 3 ft.: lvs. alternate, ovate, finely toothed: fls. white. Me. to S. C. and Tex.

arboreus. Evergreen shrub or tree to 20 ft.: lvs. alternate, ovate, finely toothed, white-tomentose beneath: fls. pale blue, fragrant. Isls. off Calif. coast.—The plant cult. in Calif. as *C. hybridus* is said to be a hybrid between *C. arboreus* and *C. spinosus.*

Arnouldi: *C. Delilianus.*

azureus: *C. cæruleus.*

cæruleus (*C. azureus*). Shrub or small tree to 20 ft. and more: lvs. alternate, oblong-lanceolate to ovate, finely toothed, rusty-tomentose beneath: fls. blue or nearly white. Mex., Guatemala.

cuneatus. Evergreen, to 14 ft., densely branched: lvs. opposite, oblong or obovate, ½ in. long, entire, pale beneath: fls. white. Calif. to Ore.

cyaneus. Tall shrub: lvs. alternate, ovate-elliptical, to ¾ in. long, finely toothed: fls. dark blue becoming lighter, with yellow anthers: pods yellowish. S. Calif.

Delilianus (*C. Arnouldi. C. hybridus*). A hybrid between *C. americanus* and *C. cæruleus:* to 3 ft.: lvs. alternate, ovate, finely toothed: fls. pale or deep blue. The commonly cult. "Gloire de Versailles" belongs here.

divaricatus. To 14 ft.: lvs. alternate, ovate, entire or slightly toothed: fls. white or blue. Calif., Lower Calif.

Fendleri. To 1½ ft., spiny: lvs. alternate, ovate, entire, silky beneath: fls. white. S. D. to Wyo. and N. Mex.

foliosus. Evergreen, to 1 ft. or more, densely branched: lvs. alternate, oblong, to ¾ in. long, pale beneath: fls. blue. Cent. Calif.

hybridus: see *C. Delilianus* and *C. arboreus.*

integerrimus. Deer-Brush. To 12 ft.: lvs. alternate, ovate, entire: fls. white, rarely pale plue or pink. Calif.

Lobbianus. Hybrid between *C. dentatus* and *C. thyrsiflorus:* evergreen shrub to 10 ft.: lvs. alternate, oblong, remotely toothed, whitish beneath: fls. dark blue.

macrocarpus (*C. megacarpus*). To 12 ft.: lvs. alternate, obovate, rather thick, entire: fls. white. Calif.

megacarpus: *C. macrocarpus.*

oliganthus. To 9 ft.: lvs. alternate, ovate, finely toothed, pale green or brown beneath: fls. deep blue or purplish. Calif.

ovatus. To 3 ft.: lvs. alternate, oblong or oval, toothed, shining above: fls. white. Vt. to Colo. and Tex.

pallidus. Hybrid between *C. Delilianus* and *C. ovatus:* to 3 ft. or less: lvs. alternate, oblong, finely toothed: fls. light blue. "Marie Simon," with flesh-colored fls. belongs here.

prostratus. Mahala Mat. Prostrate: lvs. evergreen, opposite, obovate, coarsely spiny-toothed: fls. blue. Wash. to Calif.

spinosus. To 10 ft., sometimes tree to 24 ft., often spiny: lvs. alternate, oblong, entire or finely toothed: fls. pale blue or white. Calif.

thyrsiflorus. Blue-Blossom. Evergreen, to 8 ft. or tree to 25 ft.: lvs. alternate, oblong, finely toothed, shining above: fls. blue or rarely white. Ore. to Calif.

Veitchianus. Hybrid between *C. rigidus* and *C. thyrsiflorus:* to 10 ft.: lvs. evergreen, alternate, obovate, remotely toothed, shining above, whitish beneath: fls. deep blue.

verrucosus. Low shrub: lvs. alternate, obovate, entire or slightly toothed, small, pale beneath: fls. white. S. and Lower Calif.

CEBATHA: *Cocculus.*

CECROPIA. *Moraceæ.* Trop. American trees with milky juice, large palmately-lobed peltate lvs. and unisexual fls. in dense catkins; grown in trop. countries and sometimes in S. Fla. and S. Calif. As plants are diœcious both pistillate and staminate should be planted if fruiting specimens are desired.

palmata. Snakewood Tree. To 50 ft., with soft wood: lvs. borne at ends of branches, 7–11-lobed to middle or below, rough above, white-tomentose beneath. W. Indies, S. Amer.

CEDAR: *Cedrus.* **Cigarbox-:** *Cedrela odorata.* **Ground-:** *Lycopodium complanatum.* **Incense-:** *Libocedrus.* **Red-:** *Juniperus.* **Spanish-:** *Cedrela odorata.* **Stinking-:** *Torreya taxifolia.* **West-Indian-:** *Cedrela odorata.* **White-:** *Chamæcyparis thyoides, Tabebuia pallida.*

CEDRELA. *Meliaceæ.* Trees with colored wood furnishing valuable timber, that of *C. odorata* extensively used for cigar-boxes, also several species grown for ornament: deciduous or evergreen; lvs. alternate, many-pinnate and somewhat ailanthus-like: fls. small and whitish, in panicles: fr. a woody caps., with winged seeds: occidental and oriental tropics and warm regions.

Cedrelas thrive in fertile loamy soil. Propagated by seeds, cuttings of mature wood, and root-cuttings, over heat.

fissilis. Tree to 50 ft. or more: lfts. oblong-lanceolate, densely pubescent beneath: fls. yellowish, in pubescent panicles longer than lvs., petals velvety: fr. 1 in. or more long. Panama, S. Amer., perhaps Mex.

odorata. West-Indian- or Spanish-Cedar. Cigar-box-Cedar. To 100 ft.: lfts. entire: fls. yellowish, in panicles shorter than lvs.: fr. to 1½ in. long, the seeds winged below middle. W. Indies, S. Amer.

sinensis (*Toona sinensis*). To 50 ft.: lfts. toothed: fls. white, in very long pendulous panicles: fr. 1 in. long, the seeds winged above. China; stands in N. Y. and S. New England.

Toona (*Toona ciliata*). To 70 ft., nearly evergreen: lfts. entire or wavy-margined: fls. white, fragrant, in panicles shorter than lvs.: fr. to 1 in. long, the seeds winged at both ends. Himalayas; planted in S. Fla.

CEDRONELLA. *Labiatæ.* One per. shrubby herb to 4 ft. high, native in Canary Isls. and grown in the flower-garden. Propagated by cuttings. **C. canariensis** (*C. triphylla. Dracocephalum canariense*). Canary-Balm. Lvs. of 3 oblong or lanceolate toothed lfts.: fls. white or lilac, in whorls in loose terminal spikes. For *C. cana* and *C. mexicana* see *Brittonastrum*.

CEDRUS. Cedar. *Pinaceæ.* Large evergreen trees with wide-spreading branches, of 4 species in N. Afr. and Asia, having stiff needle-like 4-angled clustered lvs. and small ovoid erect cones with closely imbricated scales. For cult. see *Conifers*. The species are not reliable north of the latitude of N. Y. on the eastern side of the continent, and then only in favorable locations; they are mostly trees for the middle and warmer parts of the country, but all except perhaps *C. brevifolia* can be grown to some extent in favorable sheltered locations in S. New England.

atlantica. Atlas C. Lvs. less than 1 in. long, bluish-green: cones to 3 in. long. N. Afr. Var. **argentea**, lvs. silvery-white; var. **aurea**, lvs. yellowish; var. **glauca**, lvs. glaucous; var. **fastigiata**, habit narrow-pyramidal; var. **pendula**, branchlets drooping.

brevifolia. Closely allied to *C. libanotica* but with shorter glaucous lvs. and shorter cones. Cyprus.

Deodara. Deodar C. Branchlets drooping: lvs. to 2 in. long, dark bluish-green: cones to 5 in. long. Himalayas. Var. **argentea**, lvs. silvery-white; var. **aurea**, lvs. yellow; var. **crassifolia**, stiff stunted tree with shorter thicker lvs.; var **pendula**, branches long and drooping; var **robusta**, a stronger form with stiffer lvs.; var. **verticillata**, compact form with bluish-white lvs.; var. **viridis**, lvs. deeper green.

libani: *C. libanotica.*

libanotica (*C. libani*). Cedar of Lebanon. Lvs. 1 in. long, dark or bright green: cones to 4 in. long. Asia Minor. Var. **glauca**, lvs. blue or silvery-white; var. **nana** (var. "Comte de Dijon"), dwarf and compact; var. **pendula**, branches drooping.

CEIBA. *Bombacaceæ.* Very large deciduous trees with digitately compound lvs., showy fls. in axillary clusters and fr. a leathery caps., the seeds with long cotton-like fiber which is the kapok of commerce; planted as a shade tree in the tropics.

Casearia: *C. pentandra.*

pentandra (*C. Casearia. Eriodendron anfractuosum*). Silk-Cotton-Tree. To 120 ft., with widely spreading branches, the trunk often 9 ft. thick and the thin buttresses sometimes extending for 30 ft.: lfts. 7, to 6 in. long: fls. white or rose, the woolly petals about 1 in. long, often appearing before the lvs.: fr. to 5 in. long. Tropics of both hemispheres.

CELANDINE: *Chelidonium.* Tree: *Macleaya cordata.*

CELASTRACEÆ. Staff-Tree Family. Widely distributed trees and shrubs, often twining, of about 45 genera, with simple mostly deciduous lvs., small regular usually bisexual fls. having 4–5 sepals, petals and stamens, superior 3–5-celled ovary, and seeds usually with a pulpy aril which is disclosed when the pericarp ruptures in autumn. Species in the following genera are cult. for ornament: Catha, Celastrus, Elæodendron, Euonymus, Gymnosporia, Maytenus, Pachistema, Tripterygium.

CELASTRUS. *Celastraceæ.* Species here entered are twining shrubs, seldom evergreen, with alternate simple lvs., greenish-white polygamous fls. in racemes or panicles, capsular fr. and seed with a crimson aril that is showy when ripe. See *Celastraceæ.*

Suitable for covering walls, trellises and the like. They thrive in common soils. Propagated by seeds sown in fall or stratified, by suckers, cuttings of young or mature wood, and root-cuttings.

angulatus. Branches angular: lvs. to 7 in. long: fls. in terminal panicles to 6 in. long: frs. orange-red. China; not hardy in northern states.

articulatus (*C. orbiculatus*). Branches spiny only when young: lvs. to 4 in. long: fls. in few-fld. axillary cymes: frs. orange-yellow. Japan, China. Var. **punctatus** is a less vigorous form with smaller lvs.

cassinoides: *Gymnosporia cassinoides.*

flagellaris. Branches with spiny stipules: lvs. to 2 in. long: fls. in few-fld. axillary cymes: frs. orange-yellow. N. China, Korea, Japan; hardy in S. New England.

orbiculatus: *C. articulatus.*

Orixa: *Orixa japonica.*

paniculatus. Branches with pale lenticular warts: lvs. to 4 in. long: fls. in terminal pendulous panicles to 8 in. long. Himalayas; adaptable S.

punctatus: *C. articulatus* var.

Rosthorniana. Lvs. to 3 in. long: fls. in nearly sessile cymes. China; not hardy far N.

scandens. Waxwork. False or Shrubby Bitter-Sweet. Lvs. to 4 in. long: fls. in terminal racemes to 4 in. long: frs. orange-yellow. Que. to N. C. and N. Mex.

CELERI: *Apium graveolens* var. *dulce.*

CELERIAC: see *Celery.*

CELERY (*Apium*, which see). Biennial or perennial herb grown for the edible leaf-stalks; it is raised from seeds, coming to horticultural maturity the same year, but flowers are normally produced the second year although the plant sometimes runs to seed the first year. The leaf-stalks are blanched in the field but the process is often completed in the storage cellar for the late kinds.

Ordinary deep fertile mellow garden land will produce good celery. It must be thoroughly prepared, and if not naturally retentive of moisture it should be supplemented with a system of irrigation or watering for dry times. The large-area commercial growing of celery is an important industry on reclaimed lands, particularly on muck and other lowlands that can be drained. Under such conditions a uniform moisture supply can be assured and the ground readily provides the proper tilth. In such areas celery-growing has become a special skilled industry of great importance.

Celery should make a continued rapid growth. It is specially important that the plants get a "quick" start. Stimulation by some form of available nitrogen, as in nitrate of soda, is advisable. This nitrate may be applied to seed-beds, about 1 teaspoonful to a gallon of water. It may also be applied to the field before transplanting. Heavy applications of well-rotted stable-manure are advisable on uplands, and a chemical fertilizer of a 4-8-12 analysis on muck lands liberally applied.

For the home-garden celery may be planted in shallow trenches to facilitate blanching, but this method is now less used than formerly. The dwarf varieties are commonly set 6 inches apart in rows 3 feet apart, and the large-growing kinds about 8 inches in rows to 5 feet distant. Blanching may be accomplished by banking with earth late in the season until only the tops are visible, by shading with boards placed on edge on either side, and by tying with paper, or a drain tile put over each plant. The late crop may be packed in boxes, the roots covered with earth, and placed in the cellar to complete the blanching. Self-blanching may also be practiced, which consists of setting the plants very close together; this requires very rich soil and plenty of moisture; the plants may be set 5 or 6 inches apart in rows 10 inches apart.

Propagation is entirely by seed which for the early crop should be sown in February or March in boxes or hotbeds and transplanted several times before being permanently set out. Seed for the late crop should be sown in April or May in a well-prepared seed-bed. The seedlings should be transplanted to the garden or field about the middle of July in the North, the roots and tops being trimmed first.

Celery is harvested by cutting the plants just beneath the crown. This is accomplished with a spade in small areas, and by special horse tools in large plantations. The plants are taken to a packing shed, where they are trimmed and washed, then tied in bunches and crated for local market or shipment. Storage of celery is combined with the blanching of it, as already indicated. Plants are taken with roots attached and placed closely in crates; the storage house or cellar should not freeze but there should be good ventilation and clean sanitary conditions. For late autumn or early winter use late celery may be stored and bleached in field trenches, the tops being covered with straw or similar material.

The celery crop is subject to devastation by early and late blight, that produce spots and holes on the foliage. These diseases may be prevented by spraying thoroughly every week or ten days with bordeaux mixture, beginning in the seed-bed. Other diseases and pests are frequent, and the grower should avail himself of the latest books and bulletins.

Celeriac is grown the same as celery for the thickened edible crown, except that no blanching is required; the leaves are not eaten after the manner of celery.

CELMISIA. *Compositæ.* Per. herbs of New Zeal. and Australia, having basal lvs. or imbricated st.-lvs. and large solitary heads of white ray- and disk-fls.; pappus of bristles; planted somewhat on Pacific Coast.

coriacea. To 3 ft.: lvs. to 2 ft. long and 3 in. wide, leathery, silvery-tomentose: heads to 3 in. across, on woolly scapes. New Zeal.

longifolia. To 1½ ft.: lvs. linear or linear-lanceolate, to 10 in. long, white-tomentose beneath. Australia.—The New Zeal. plant known under this name has been separated into other species.

spectabilis. Lvs. to 6 in. long and ¾ in. wide, leathery, woolly beneath: heads 1½ in. across, on woolly scapes. New Zeal.

CELOSIA. *Amaranthaceæ.* The cult. celosias are herbaceous annuals, with the st. and branches terminated by dense chaffy spikes usually enlarged and highly colored and in various often fantastic shapes; native in warm countries. The fls. are small and not individually showy.

Celosias thrive in fertile soil with plenty of moisture. Propagated by seeds.

argentea. To 3 ft.: lvs. linear to ovate-lanceolate, to 2 in. long: fl.-spikes 1–4 in. long, erect or drooping, silvery-white. Tropics.—Little cult. Var. **cristata** (*C. cristata*). Cockscomb. Infl. in many forms, some with heavy-crested heads, others plumy or feathered with a large number of intermediates, the colors ranging from white to yellow, purple, and shades of red; also with variegated lvs. Often the cult. types have Latin-form names as *C. Thompsonii*, *Thompsonii magnifica*, *Childsii*, *plumosa*, *floribunda*.

Childsii: *C. argentea* var.

cristata: *C. argentea* var.

floribunda. Much branched green or glaucous glabrous shrub to 12 ft.: lvs. triangular-ovate to somewhat hastate, to 8 in. long, becoming oblong toward top: fls. very many in close panicles. Lower Calif.; sometimes planted in S. Calif. for general interest.—The flower-garden plant known as *C. floribunda* is a form of *C. argentea* var. *cristata*.

Huttoni. To 2 ft., bushy, pyramidal: lvs. red or crimson: spikes 1½ in. long, cylindrical, red. Java.

plumosa: *C. argentea* var.

Thompsonii: *C. argentea* var.

CELSIA. *Scrophulariaceæ.* Yellow-fld. bien. or per. herbs much like Verbascum but with 4 stamens instead of 5; mostly native in Medit. region and Asia, frequently planted for ornament.

Propagated by seeds sown in the greenhouse, the plants set out in the open after all danger from frosts is past; also by cuttings.

Arcturus. Cretan Bears-Tail. To 1½ ft., pubescent: lvs. ovate, toothed, the lower lyrate-pinnatifid: fls. clear yellow, long-stalked, with purple anthers, in loose racemes. Crete, Asia Minor.

cretica. Cretan Mullein. Stout hairy plant to 6 ft.: lvs. ovate, clasping, toothed, the lower lyrate-pinnatifid: fls. yellow marked with purple, almost sessile, in loose racemes, violet anthers. Medit. region.

CELTIS. Hackberry. *Ulmaceæ.* Northern hemisphere deciduous or seldom evergreen trees or rarely shrubs, with alternate elm-like lvs., unisexual or bisexual small fls., and drupaceous frs.

Most of the species are hardy in the northern and north-central states where they are grown for shade and ornament. They are not particular as to soil. Propagated by seeds, layers and cuttings in the fall, or sometimes grafted on *C. occidentalis.*

Audibertiana: *C. occidentalis* var. *crassifolia.*

australis. To 80 ft.: lvs. to 6 in. long, sharply toothed, grayish-green and pubescent beneath: fr. dark purple. S. Eu., N. Afr., W. Asia.—Grown in Calif.

Bungeana (*C. Davidiana*). To 50 ft.: lvs. to 3 in. long, slightly toothed only above middle, shining above: fr. purplish-black. China, Manchuria, Korea.

caucasica. Similar to *C. australis* but with lvs. to 3 in. long and reddish-brown frs. Caucasus, W. Asia.

cordata: *C. occidentalis.*

Davidiana: *C. Bungeana.*

Douglasii (*C. rugulosa*). To 20 ft.: lvs. to 3 in. long, coarsely toothed, pubescent on veins beneath: fr. brown. Colo. to Wash.—The Colorado form is separated by some authors as *C. rugulosa*, distinguished by the lvs. being pubescent beneath.

Julianæ. To 80 ft.: lvs. to 6 in. long, wavy-toothed above the middle, yellowish-green and pubescent beneath: fr. orange. China.—Grown in Calif. and mild climates.

labilis. To 60 ft.: lvs. to 4 in. long, wavy-toothed above the middle, pale or brownish beneath, pubescent on veins: fr. orange. China.—Grown in Calif. and mild climates.

lævigata (*C. mississippiensis. C. occidentalis* var *integrifolia*). SUGARBERRY. MISSISSIPPI H. To 100 ft.: lvs. to 4 in. long, long-acuminate, usually entire, thin: fr. orange-red becoming dark purple. S. Ind. to Fla. and Tex.

mississippiensis: *C. lævigata.*

occidentalis (*C. cordata*). To 120 ft.: lvs. to 5 in. long, toothed, shining above, paler below: fr. orange-red to dark purple. Que. to N. C. and Ala. Var. **crassifolia** (*C. Audibertiana*) has firmer larger lvs. pubescent on nerves beneath.

orientalis: *C. Tournefortii.*

rugulosa: *C. Douglasii.*

sinensis. To 60 ft.: lvs. to 4 in. long, wavy-toothed, pubescent beneath when young: fr. dark orange. China, Korea, Japan.—Grown in Calif. and elsewhere.

Tala. Shrub, with short spines: lvs. about 1 in. long, coarsely toothed or nearly entire. Uruguay.

Tournefortii (*C. orientalis*). To 20 ft.: lvs. to 3 in. long, toothed, bluish- or grayish-green: fr. reddish-yellow. S. E. Eu., W. Asia.

CENTAUREA. *Compositæ.* Herbaceous annuals and perennials with entire, pinnately lobed or divided lvs.: heads solitary or panicled, purple, blue, yellow or white; fls. all tubular, the marginal ones often enlarged; pappus of scales or bristles. The genus yields a wide variety of ornamental subjects from flower-garden annuals to bedding and foliage plants, basket plants, and stout thistle-like species for rear background effects. They are prevailingly Old World plants.

The annuals are grown from seeds sown directly in the garden or started earlier indoors. *C. Cineraria* and other foliage types are increased from cuttings taken in September and carried over winter indoors or sometimes from seeds sown in August. *C. Cyanus*, the bachelors-button, is an easily grown hardy annual.

alpina. To 3 ft.: lvs. spiny, tomentose beneath: heads yellow. S. E. Eu.

Amberboi: *C. moschata.*

americana. BASKET-FLOWER. Ann. to 6 ft.: lvs. mostly entire, oblong-lanceolate, to 5 in. long: heads solitary, rose or flesh-colored, sometimes purplish, to 5 in. across, marginal fls. enlarged; bracts of involucre with fringed appendages. Mo. to La. and Mex. Var. **alba** has white fls.

argentea: *C. gymnocarpa.*

babylonica. Per. 4–12 ft., silvery-white: basal lvs. lyrate, to 2 ft. long; st.-lvs. oblong to lanceolate, entire or wavy: heads yellow, 1½ in. long, in panicles; bracts of involucre with short recurved tips. Asia Minor.

benedicta: *Cnicus benedictus.*

candidissima: see *C. Cineraria.*

Cineraria. DUSTY MILLER. Per. to 1 ft. or more, white-tomentose: lvs. pinnately parted into obtuse linear-lanceolate lobes: heads rather large, golden-yellow or purple; bracts of involucre ciliate. S. Italy, Sicily.—For the plant known in cult. as var. *candidissima* see *Senecio leucostachys.*

Clementei. Per., white-woolly: lvs. pinnate into ovate lobes: heads terminal, yellow; bracts of involucre ciliate. Spain.

conifera: *Leuzea conifera.*

cristata. Bien.: lower lvs. 3-pinnate, upper linear, entire: heads pale pink; bracts of involucre ciliate. S. Eu.

Crocodylium. Ann. to 4 ft.: lower lvs. ovate or lyrate, upper pinnate into linear segms.: heads solitary, rose, marginal fls. enlarged. Syria.

Crupina: *Crupina vulgaris.*

Cyanus. CORNFLOWER. BACHELORS-BUTTON. BLUE-BOTTLE. Popular hardy ann. to 2 ft., woolly-white only when young: lvs. linear, to 6 in. long, entire or lower toothed, sometimes pinnately cut: heads blue, purple, pink or white, to 1½ in. across, marginal fls. enlarged; bracts of involucre fringed. S. E. Eu.; frequently self-sows and sometimes escapes. Var. **flore-pleno** has double fls.

cynaroides (*Rhaponticum cynaroides*). Per.: lvs, oblong to ovate, pinnatifid: heads solitary or few, purplish; bracts of involucre fringed. Pyrenees.

dealbata. Per. to 2 ft.: lvs. pinnate into coarsely toothed lobes, lower to 1½ ft. long, white-tomentose beneath: heads solitary, inner fls. red, marginal ones rosy or white; bracts of involucre fringed. Asia Minor, Persia.

depressa. Per., almost prostrate, white-pubescent: lower lvs. oblong, entire or lyrate, upper linear-lanceolate: heads blue, about 1½ in. across, marginal fls. enlarged; bracts of involucre with black or white margins. Persia, Caucasus.

gymnocarpa (*C. argentea. C. plumosa*). DUSTY MILLER. Per. to 2 ft., densely white-woolly: lvs. 2-pinnate into linear entire lobes: heads in panicles, small, rose-violet or purple, mostly hidden by the lvs. Capri.

imperialis. Supposed hybrid between *C. moschata* and its var. *alba*: to 4 ft.: heads white, rose, lilac or purple, fragrant.

Jacea. Per. to 2 ft.: lvs. entire, lanceolate: heads solitary, purple or rarely white, to 1½ in. across, marginal fls. enlarged; bracts of involucre brown and fringed. Cent. Eu.; nat. in N. Amer.

macrocephala. Per. to 3 ft.: lvs. ovate-lanceolate, toothed: heads solitary, yellow, to 4 in. across; bracts of involucre fringed. Armenia.

maculosa. Bien.: lvs. 1–2-pinnate into linear segms.: heads pale purple or rarely white. S. Eu.

Margaritæ: *C. moschata* var. *alba.*

melitensis. Ann. to 4 ft., gray-pubescent, the sts. winged by decurrent lf.-bases: basal lvs. lyrate, upper entire or lobed: heads solitary or clustered, yellow, small; bracts of involucre spiny-tipped. Medit. region; nat. in N. and S. Amer.

montana. MOUNTAIN BLUET. Per. to 1 ft. or more: lvs. broadly lanceolate, silvery-white when young: heads blue, to 3 in. across, marginal fls. enlarged; bracts of involucre with black fringe. Eu. Color forms are **alba, carnea, citrina, purpurea** and **rosea.**

moschata (*C. odorata. C. suaveolens. C. Amberboi*). SWEET SULTAN. Ann., glabrous, to 2 ft.: lvs. toothed or pinnately cut: heads solitary, fragrant, white, yellow or purple, 2 in. across, marginal fls. enlarged; bracts of involucre entire. Orient. Var. **alba** (*C. Margaritæ*) has white fls.

muricata: *Amberboa muricata.*

nervosa. Per. to 2½ ft.: lvs. lanceolate, toothed: heads solitary, deep purple; bracts of involucre fringed. Cent. Eu.

nigra. KNAPWEED. HARDHEADS. Per., rough-pubescent, to 2 ft.: lvs. oblong or lanceolate, entire or toothed, to 6 in. long: heads solitary, rose-purple, to 1 in. across; bracts of involucre fringed. Eu.; nat. in N. Amer. Var. variegata has lvs. margined with white.

odorata: *C. moschata.*

orientalis (*C. rigidifolia*). Per. to 3 ft.: lvs. leathery, mostly pinnately cut: heads yellow; bracts of involucre with pale or reddish ciliate appendages. Eu.

phrygia. Per. to 2 ft.: lvs. oblong, toothed: heads solitary, rose; bracts of involucre fringed. Eu.

plumosa: *C. gymnocarpa.*

pulcherrima (*Ætheopappus pulcherrimus*). Per. to 2½ ft.: lvs. lanceolate or pinnatifid, to 7 in. long, gray-pubescent beneath: heads solitary, purple; bracts of involucre brown and fringed. Caucasus.

rigidifolia: *C. orientalis.*

ruthenica. Per. to 3 ft., glabrous: lvs. pinnately cut into linear toothed lobes: heads usually solitary, pale yellow, marginal fls. enlarged; bracts of involucre entire. Eu., W. Asia.

rutifolia. Per. to 3 ft., gray-pubescent: lower lvs. pinnate, upper oblong, entire: heads 5–7, rose, marginal fls. enlarged; bracts of involucre ciliate at tips. Bulgaria.

Scabiosa. Per. to 2 ft., pubescent: lvs. pinnately cut, to 6 in. long: heads solitary, purple, 2 in. across, marginal fls. enlarged; bracts of involucre fringed and black-margined. Eu.; nat. in N. Amer.

sordida. Per. to 2 ft.: lvs. pinnatifid into linear entire lobes: heads purple or yellowish; bracts of involucre ciliate and spiny-tipped. Possibly a hybrid.

suaveolens: *C. moschata.*

verbascifolia. Per., branching: lvs. oval-lanceolate, toothed, white-tomentose: heads violet; bracts of involucre brown. Arabia.

CENTAURIDIUM DRUMMONDII: *Xanthisma texanum.*

CENTAURIUM (*Erythræa*). CENTAURY. *Gentianaceæ.* Small mostly ann. herbs with opposite, simple and entire lvs. and red or rose more or less pink-like bright fls. borne in cymes.

Sometimes cultivated in the rock-garden and in borders. They thrive in light sandy loam and require protection from sun and frost. Propagated by seeds, the perennials by cuttings and division. The following are annuals or perhaps sometimes biennials.

Beyrichii. To 8 in., sts. ascending: lvs. to 1 in. long: fls. deep pink, 1 in. across. Ark. to Tex.

conferta (*Erythræa conferta* and *E. chloodes*). Ann. or bien. to 4 in., glabrous, the sts. many: lvs. fleshy, oblong, obtuse, lower ones in rosette, upper ones narrower: fls. rose. England, S. W. Eu.

diffusum: *C. Massoni.*

Massoni (*C. diffusum*). To 4 in., tufted: lvs. to ½ in. long: fls. bright rose. Azores.

pulchella (*C. ramosissima*). To 6 in.: lvs. oval: fls. pink. Eu.

ramosissima: *C. pulchella.*

venustum. To 8 in.: lvs. to 1 in. long: fls. rose, the throat white spotted with red. Calif.

CENTAURY: *Centaurium.*

CENTIPEDE-PLANT: *Homalocladium.*

CENTRADENIA. *Melastomaceæ.* Herbs and small shrubs native in Mex. and Cent. Amer., with entire unequal lvs., small pink or white fls. in cymes, and capsular fr.; grown in greenhouses for the attractive fls. and often showily colored lvs. They thrive in soil composed of rich leaf-mold and sharp sand. Propagated by cuttings.

floribunda. Little shrub with obscurely angled not winged somewhat pubescent sts.: lvs. narrow-lanceolate, 3-nerved, to about 2 in. long, red underneath: fls. pink. Mex.

grandifolia. To 2 ft., the sts. winged: lvs. oblong-lanceolate, very unequal-sided, about 5-nerved, to 6 in. long, bright red beneath: fls. rose-pink. Mex.

CENTRANTHUS (*or Kentranthus.*) *Valerianaceæ.* Ann. or per. herbs native in the Medit. region, having small white or red fls. in dense terminal clusters, the calyx pappus-like, corolla tubular and 5-parted, spurred at base, stamen 1. A few species are grown in the flower-garden, *C. ruber* being common. Propagated by seeds and division.

angustifolius. Per. to 2 ft., glaucous: lvs. linear-lanceolate or linear, entire, to 3 in. long: fls. rose, fragrant. S. Eu.

Calcitrapa. Ann. to 1½ ft.: lvs. pinnatifid, the lower lyrate, to 3 in. long: fls. rose. S. Eu., N. Afr.

macrosiphon. Ann. to 2 ft.: lvs. ovate, to 3 in. long, toothed or lobed, glaucous: fls. rose. Spain. Var. **albus** has white fls.

ruber (*Valeriana coccinea* and *rubra*). RED VALERIAN. JUPITERS-BEARD. Per. to 3 ft., glaucous: lvs. ovate to lanceolate, to 4 in. long, nearly entire: fls. crimson or pale red, fragrant. Eu. to S. W. Asia. Var. **albus** has white fls.

CENTROPOGON. *Lobeliaceæ.* Trop. American shrubs or herb-like with alternate toothed lvs., red, orange or greenish tubular 2-lipped fls. having the stamens united with the lower part of corolla-tube, and fr. a berry; grown in hanging-baskets in a warm greenhouse. Propagated by cuttings over heat.

Lucyanus. To 2 ft.: lvs. ovate- or oblong-lanceolate: fls. rose-carmine, 1½ in. long, clustered at ends of branches, the stamen-column exserted.

surinamensis. To 3 ft., with purplish sts.: lvs. ovate, to 6 in. long: fls. red, to 2 in. long, solitary at ends of branches, the stamen-column exserted.

CENTROSEMA (*Bradburya*). BUTTERFLY-PEA. CONCHITA. *Leguminosæ.* Twining vines with pinnate lvs. mostly of 3 lfts., white or purplish papilionaceous fls. in the axils, and flat linear pods; native of Amer., a few species grown as cover-crops in the tropics.

brasilianum. Lfts. ovate-oblong, to 2½ in. long: fls. white or blue, 1½ in. across: pods to 4 in. long and ⅙ in. wide. Brazil.

Plumieri. Lfts. ovate, to 5 in. long, blackening in drying: fls. 2 or more in. across, white with purple center: pods to 6 in. long and ½ in. wide. Trop. Amer.

pubescens. Lfts. ovate to oblong, to 3 in. long: fls. white or yellowish: pods to 8 in. long and ¼ in. wide. Trop. Amer.

virginianum. Lfts. ovate to linear-lanceolate, to 2 in. long: fls. purple to whitish: pods to 5 in. long and ⅛ in. wide. E. N. Amer., trop. Amer., Afr.

CENTROSOLENIA BULLATA: *Episcia tessellata.*

CENTURY PLANT: *Agave.*

CEPHAELIS (*Evea*). *Rubiaceæ.* Trop. shrubs or small trees with opposite lvs. and rather small fls. in terminal heads subtended by involucral bracts; one intro. in S. Calif.

tomentosa. Shrub to 15 ft., hairy: lvs. lanceolate to elliptic, to 10 in. long, long-acuminate: fls. yellow, the bright red bracts to 2 in. across: fr. blue. Mex. to Bolivia.

CEPHALANDRA: *Coccinea.*

CEPHALANTHUS. BUTTON-BUSH. *Rubiaceæ.* A few shrubs or small trees with opposite or whorled entire lvs., ours deciduous, and small tubular 4-lobed fls. in dense globose showy heads, the styles long-exserted; native in Asia, Afr. and N. Amer.

Of easy cultivation in good land if moist. Propagated by seeds and by cuttings of mature wood in autumn or green wood in spring.

occidentalis. To 20 ft.: lvs. ovate to oval-lanceolate, to 6 in. long, shining above: fls. creamy, in long-stalked heads about 1 in. across, July–Sept. N. Amer., in swamps.—It runs into narrow-lvd. and pubescent forms.

CEPHALARIA. *Dipsaceæ.* Ann. and per. Old World mostly coarse scabiosa-like herbs with opposite simple or compound lvs., small 4-parted whitish, yellowish or bluish fls. in long-stalked prominent heads, and fr. a ribbed achene; grown in the flower-garden. Easily propagated by seeds.

alpina. Per. to 6 ft.: lvs. pinnately cut into toothed decurrent lanceolate segms.: fls. sulfur-yellow, in heads to 1½ in. across. S. Eu.

balearica. Per. to 2½ ft.: lvs. entire or lyrate-pinnatifid, oval or the upper entire, toothed, shining: fls. yellowish-white. Balearic Isls.

centauroides: a name appearing in lists, but of confused and uncertain botanical standing.

rigida. Per. to 3 ft.: lvs. stiff, ovate-oblong, to 3 in. long, toothed: fls. white. S. Afr.

tatarica. Per. to 6 ft.: lvs. pinnately divided into toothed broad-lanceolate lfts.: fls. creamy-white, in heads to 2 in. across. Russia, W. Asia.

CEPHALOCEREUS. *Cactaceæ.* About 50 species of tall slender-columnar spiny or bristle-bearing cacti, Fla. and N. Mex. to Ecuador and Brazil, often with long white hair or wool at or near the top: fls. small, mostly nocturnal, fleshy, often in a head-like aggregation. See *Cacti.*

With the exception of *C. senilis* the species of Cephalocereus are little known in our horticulture. They are handled in the same way as the columnar or arboreous kinds of Cereus, mostly in large collections of cacti or succulents. They are propagated by seeds and cuttings.

euphorbioides (*Cereus* and *Pilocereus euphorbioides*). Columnar and usually simple, to 15 ft. and more, with 8 sharp ribs and areoles close together and felted with white, the flowering ones not confluent: fls. diurnal, brownish outside, rose-red inside, tube to 2 in. long. Probably S. Amer.

Nickelsii: *C. polylophus.*

polylophus (*C. Nickelsii. Cereus* and *Pilocereus polylophus*). Erect and simple, to 40 ft., ribs 15–18, the small areoles about ½ in. apart and felted but not woolly: fls. about 2 in. long, red. Mex.

senilis (*Cereus* and *Pilocereus senilis*). OLD-MAN CACTUS. To 40 ft. and more, mostly simple, ribs 20–30, the areoles bearing long white bristles or hairs and aggregated into a head: fls. about 2 in. long, rose-colored. Mex.

CEPHALOSTACHYUM. *Gramineæ.* East Indian bamboo-like shrubby grasses with spikelets borne in heads or the heads panicled or clustered, stamens 6. Sometimes planted in warm countries. See *Bamboo.*

pergracile. To 40 ft., sts. glaucous: lvs. to 1 ft. long and 1½ in. wide, rough on edges, rugose: heads about 2 in. apart in the large panicles.

CEPHALOTAXUS. PLUM-YEW. *Taxaceæ.* Asian evergreen trees and shrubs with linear lvs. having 2 broad glaucous bands beneath, and drupe-like stalked frs. or seeds; they can be grown in N. Y. and New England. Distinguished from Taxus in the glaucous lines on under surface of lvs., the drupe-like fr. and characters of fls. For cult. see *Conifers.*

drupacea. Tree to 30 ft.: lvs. 1–2 in. long, abruptly pointed: fr. green. Japan. Hort. vars. are: **fastigiata,** of columnar habit; **nana,** to 6 ft. tall; **pedunculata** (*C. Harringtonia*), with heads of male fls. long-stalked; hardy in sheltered positions Northeast, but grows slowly; **sinensis,** a shrub to 12 ft. with tapering lvs. China.

Fortuni. Tree to 30 ft.: lvs. 2–3 in. long, tapering: fr. purple. China; hardy in sheltered positions in the Northeast, but usually remains a bush.

Harringtonia: *C. drupacea* var. *pedunculata.*

Oliveri. Shrub: lvs. closely set, 1 in. long, spiny-pointed. China.

CERASTIUM. MOUSE-EAR CHICKWEED. *Caryophyllaceæ.* Herbaceous often tufted or mat-forming annuals and perennials, usually more or less hairy and sometimes hoary, with white fls. in terminal cymes and small entire opposite lvs.; of world-wide distribution, especially abundant in temp. zones.

Cerastiums are employed in rock-gardens or for edgings in bedding and borders. They grow well under ordinary garden conditions. Propagated by divisions or by cuttings taken after flowering, also by seeds.

alpinum. Per. to 6 in., generally silky-hairy: lvs. small: fls. white, solitary or in rather hairy few-fld. panicles, summer. Que., Lab., arctic Amer., and in alpine and arctic Eu. and Asia.

argenteum: *C. grandiflorum.*

arvense. STARRY GRASSWORT. Per. to 10 in., densely tufted with erect or ascending sts.: lvs. very narrow, to 1½ in. long: fls. numerous, white, Apr.–May. N. Amer., Eu., Asia. Var. **compactum** is a low form.

Biebersteinii. Per. to 6 in., creeping and spreading: lvs. grayish-woolly, to 1½ in. long and ⅕ in. wide: fls. white, May–June. Mts. of Asia Minor.

Boissieri (*C. gibraltaricum*). Per. to 1 ft.: lvs. silvery: fls. large, white, in cymes. Spain.

gibraltaricum: *C. Boissieri.*

grandiflorum (*C. argenteum*). Per., creeping, to 8 in.: lvs. linear, grayish: fls. transparent white. E. Eu.

Lerchenfeldianum. Erect, to 8 in.: lvs. lanceolate, about ½ in. long and ¼ in. wide, ciliate: fls. white, the cymes usually many-fld. Eu.

tomentosum. SNOW-IN-SUMMER. Per., creeping, branching, to 6 in., grayish-woolly: lvs. to ¾ in. long and ⅛ in. wide: fls. white, rather large, early summer. Eu.

villosum: the plants cult. under this name are probably *C. alpinum.*

CERASUS: *Cherry*; see *Prunus.*

CERATOCHLOA PENDULA: *Bromus unioloides.*

CERATONIA. *Leguminosæ.* One evergreen tree to 50 ft., with pinnate lvs. of 4–6 round or obovate shining lfts. to 4 in. long, small red fls. in short lateral racemes from old branchlets, and flattened leathery pods to 1 ft. long. **C. Siliqua,** CAROB, ST. JOHNS-BREAD, from the E. Medit. region, has been intro. into S. Calif. and Fla. for the pods which are eaten by live-stock and as human food; a special dehydrated product has been developed as a breakfast food and for other uses. A very useful tree.

The carob sometimes withstands a few degrees of frost but is generally adapted to the same range as the orange. It will grow on any well-drained soil, and trees in orchards should be planted 35–40 feet apart. Propagated by seeds, preferably under glass, and the seedlings afterwards budded; or by cuttings over bottom heat.

CERATOPETALUM. *Cunoniaceæ.* Australian resinous trees or shrubs with opposite lvs. of 1–3 digitate lfts. and small white, rose or yellow fls. in terminal cymes or panicles; grown under glass or out-of-doors in the S. Propagated by cuttings of half-ripened wood.

apetalum. Tree to 60 ft., bark silvery: lfts. usually 1, ovate-lanceolate, to 5 in. and more long, toothed: fls. without petals, calyx to ¼ in. long in fr.

gummiferum. Tree to 40 ft.: lfts. 3, lanceolate, to 1½ in. and more long, toothed: fls. with deeply lobed petals, calyx to ½ in. long in fr.

CERATOPHYLLUM, the only genus of *Ceratophyllaceæ.* One submerged aquatic herb, widely distributed in ponds and lakes in temp. and trop. regions, sometimes grown in aquaria for its foliage. **C. demersum.** HORNWORT. Lvs. forked into thread-like divisions, to 1 in. long, in whorls: fls. minute, unisexual, without perianth, solitary and sessile in the axils: fr. oval, with a spine-like beak.—Of easy cult., pieces being transferred from ponds.

CERATOPTERIS. WATER-FERN. FLOATING-FERN. *Parkeriaceæ.* The only true aquatic ferns, growing in the mud with the sterile lvs. often floating, the fertile lvs. erect, 2–4-pinnate.

These ferns are useful in ponds and aquaria, planted in pots and submerged slightly. Propagated by buds which are formed on all parts of the leaves.

cornuta: *C. thalictroides.*

pteridoides. Sterile lvs. to 10 in. long, short-stalked, irregularly lobed, floating; fertile lvs. erect, to 16 in. long, divided into linear segms. Fla. to Brazil.

thalictroides (*C. cornuta*). Sterile lvs. long-stalked, 1–2-pinnatifid into triangular segms., not floating; fertile lvs. similar but segms. linear. Old World tropics.

CERATOSTIGMA. *Plumbaginaceæ.* Per. herbs or shrubs with alternate simple lvs. and blue or rose salver-shaped fls. in terminal clusters or heads; grown in the border. Propagated by division and cuttings.

Griffithii. Low shrub, much branched, rusty-hairy: lvs. spatulate, with red margins: fls. blue. India.

plumbaginoides (*Plumbago Larpentæ*). Per. to 1 ft., diffuse: lvs. obovate, to 3 in. long, the margins ciliate: fls. deep blue, ½ in. across, Aug.–Sept. China; hardy N.

Willmottianum. Shrub to 5 ft.: lvs. rhombic, to 2 in. long, ciliate: fls. bright blue with rosy tube, to ¾ in. across, July–Nov. China.

CERATOZAMIA. *Cycadaceæ.* Mexican palm-like cycads with stiff pinnate lvs. borne in a whorl at top of short trunk, the fls. in cones and the cone-scales horned; 6 species, one sometimes grown in the greenhouse or out-of-doors in warm regions. For cult. see *Cycas.*

angustifolia: an unidentified hort. name.

longifolia: *C. mexicana.*

mexicana (*C. longifolia*). To 4 or rarely 6 ft., trunk short: lvs. about 3 ft. long, with 15–20 pairs of lfts., petioles prickly.

CERBERA THEVETIA: *Thevetia nereifolia.*

CERCIDIPHYLLACEÆ. CERCIDIPHYLLUM or KATSURA-TREE FAMILY. Only the genus Cercidiphyllum comprises this family which is separated from Trochodendraceæ: lvs. opposite, with stipules: carpel in the fl. 1.

CERCIDIPHYLLUM. *Cercidiphyllaceæ.* One bushy deciduous tree sometimes attaining 100 ft., from Japan. **C. japonicum.** KATSURA-TREE. Lvs. orbicular or ovate, to 4 in. long, cordate at base, obtuse, wavy-toothed, palmately veined, becoming yellow or scarlet in autumn: fls. unisexual, before the lvs.: fr. a pod about ¾ in. long. Japan. Var. **sinense** is a taller form from China.—The katsura-tree grows best in rich moist soil; hardy in N. Y. and Cent. New England. Propagated by seeds, cuttings of green wood in spring, or by layers.

CERCIDIUM. *Leguminosæ.* A few trees and shrubs in the warmer parts of Amer., with alternate bipinnate deciduous lvs., sharp spines and green-barked branches: fls. not papilionaceous, nearly regular, yellow, in short axillary racemes: pod flattish, linear or oblong. **C. Torreyanum,** PALO VERDE, is a characteristic small bushy tree in the arid regions of Mex., Ariz., S. Calif. and sometimes planted in its region: to 25 ft., leafless most of the year, the foliage appearing in spring and soon falling, sometimes a second leafage in autumn: fls. to ¾ in. across: pods to 3 in. long.

CERCIS. REDBUD. JUDAS-TREE. *Leguminosæ.* Trees and shrubs native in N. Amer., S. Eu. and Asia, with simple entire broad lvs., pink or red imperfectly papilionaceous fls. in racemes or clusters appearing in spring before or with the lvs., and flattened pods having narrow wings on the ventral suture.

Redbuds thrive in fertile sandy loam; only *C. canadensis* is hardy north of New York. Propagated by seeds sown in spring in heat; by layers, greenwood cuttings in spring, or *C. chinensis* by soft cuttings in summer under glass.

canadensis. Shrub or tree to 40 ft.: lvs. roundish, abruptly acute: fls. rosy-pink, ½ in. long, in clusters: pods to 3½ in. long. N. J. to Fla. and Tex. Var. **alba** has white fls. and **plena** double fls.

chinensis (*C. japonica*). Tree to 50 ft.: lvs. roundish, abruptly acute: fls. purplish-pink, ¾ in. long, in clusters: pods to 5 in. long. China, Japan.

japonica: *C. chinensis.*

occidentalis. Shrub to 15 ft.: lvs. kidney-shaped, notched or obtuse at tip: fls. reddish, ½ in. long, in clusters: pods 2½ in. long. Calif.

racemosa. Tree to 30 ft.: lvs. roundish, abruptly acute: fls. rosy-pink, ½ in. long, in many-fld. racemes: pods to 4 in. long. Cent. China.

reniformis. Shrub or tree to 40 ft.: lvs. reniform, blunt-pointed: fls. reddish, ½ in. long, in clusters: pods to 4 in. long. Tex., N. Mex.

Siliquastrum. Shrub or tree to 40 ft.: lvs. roundish, obtuse or notched at tip: fls. purplish-rose, ¾ in. long, in clusters: pods to 4 in. long. S. Eu., W. Asia. Var. **alba** has white fls.

CERCOCARPUS. MOUNTAIN MAHOGANY. *Rosaceæ.* Evergreen shrubs or partially deciduous small trees native in W. N. Amer., with simple lvs., small greenish or reddish fls. without petals, solitary or clustered, in spring and summer, and fr. an achene with a long feathery style.

Sometimes planted as shrubbery in regions of which they are native or in similar places; they succeed in dry soils and mostly with sunny exposure. Propagated by seeds or cuttings.

betulæfolius: *C. betuloides.*

betuloides (*C. betulæfolius*). To 30 ft.: lvs. obovate, to 2 in. long, toothed, pale beneath. Calif.

ledifolius. To 40 ft.: lvs. lanceolate, to 1 in. long, with entire revolute margins, pubescent beneath. Wash. to Calif. and Ariz.

montanus (*C. parvifolius*). To 6 ft.: lvs. obovate, to 2 in. long, toothed, pale beneath, pubescent both sides. S. D. to New Mex.

parvifolius: *C. montanus.*

Traskiæ. To 20 ft.: lvs. broadly ovate, to 2 in. long, toothed toward apex, densely white-tomentose beneath. Catalina Isl.

CEREUS. *Cactaceæ.* Some 900 names have been used in Cereus, a genus formerly held to include many inharmonious species; as now defined, it has about two dozen species in S. Amer. and W. Indies: mostly arborescent columnar plants (but sometimes spreading or prostrate), often massive, usually branching, strongly angled or ribbed, areoles spiny and more or less short-woolly but not bearing long hairs: fls. funnelform, mostly white, nocturnal, tube nearly or quite naked on outside: fr. naked. See *Cacti.*

The word Cereus is most popularly known in the name "night-blooming cereus," but the plants so designated are now placed in other genera, particularly in Selenicereus, Nyctocereus and Hylocereus. The kinds of true cereus are not much known in cultivation with us, and mostly under glass. The flowers are not very attractive or striking. The plants are mostly large and columnar. They propagate readily by seeds and cuttings.

æthiops (*C. cærulescens*). Bush-like, to 6 or 7 ft., sts. bluish-green to purplish, ribs 7 or 8, areoles large and black: fls. 7 in. or more long and about 5 in. across, white. Brazil.

alacriportanus (*C. peruvianus* var. *alacriportanus*). Tall and columnar, to 6 ft., ribs mostly 5 and strongly compressed, the areoles nearly or quite 1 in. apart, spines 6 to 9 and spreading: fls. 8 or 9 in. long and 4 in. broad, white with rosy tinge. S. Brazil, Paraguay.

azureus. Slender and flexuose, 3–4 ft. high and 1 in. diam., bluish, ribs 6 or 7, areoles several inches apart, radial spines 8–12: fls. 4–5 in. long, white. Brazil.

cærulescens: *C. æthiops.*

Hankeanus: *C. validus.*

Hildmannianus. Tall and columnar, to 15 ft., often much branched, ribs 5 or 6, young joints dark blue, areoles distant and developing a few spines: fls. to 9 in. long, white, inner segms. obtuse. Brazil.

Jamacaru. To 30 ft., very much branched, with short woody trunk, the top compact of upright branches, joints blue when young, ribs 4–6, areoles large and about 1 in. apart, spines usually many: fls. 1 ft. long, white, green outside, ovary purplish. Brazil.

peruvianus. Tall, to 40 ft. or more, much branched and tree-like, branches usually green but sometimes glaucous, ribs 4–9, spines needle-like: fls. about 6 in. long, outer segms. red or brownish, inner white. S. E. S. Amer.

validus (*C. Hankeanus*). Shrubby, 6 ft. or more, somewhat branched, glaucous when young, ribs 4–8 and obtuse, radial spines 5 and short and stout: fls. funnelform, reddish outside, white or reddish inside. Argentina.

Other names in Cereus may now be discovered in the following places:

acifer: *Echinocereus acifer.*
aggregatus: *Coryphantha aggregata.*
alamosensis: *Rathbunia alamosensis.*
amecamensis: *Heliocereus amecamensis.*
Baumannii: *Cleistocactus Baumannii.*
baxaniensis: *Acanthocereus pentagonus.*
Berlandieri: *Echinocereus Blanckii.*
biformis: *Disocactus biformis.*
Blanckii: *Echinocereus Blanckii.*
Boeckmannii: *Selenicereus Boeckmannii.*
Bonplandii: *Harrisia Bonplandii.*
Bridgesii: *Trichocereus Bridgesii.*
cæspitosus: *Echinocereus Reichenbachii.*
calcaratus: *Hylocereus calcaratus.*
candicans: *Trichocereus candicans.*
Cavendishii: *Monvillea Cavendishii.*
chiloensis: *Trichocereus chiloensis.*
Chiotilla: *Escontria Chiotilla.*
chloranthus: *Echinocereus chloranthus.*
chrysomallus: *Pachycereus chrysomallus.*
cinerascens: *Echinocereus cinerascens.*
coccineus: *Echinocereus coccineus; Heliocereus elegantissimus, Mediocactus coccineus.*
colubrinus: *Cleistocactus Baumannii.*
Columna-Trajani: *Pachycereus Columna-Trajani.*
conglomeratus: *Echinocereus conglomeratus.*
conoideus: *Echinocereus conoideus.*
costaricensis: *Hylocereus costaricensis.*
ctenoides: *Echinocereus ctenoides.*
dasyacanthus: *Echinocereus dasyacanthus.*
Donkelaarii: *Selenicereus Donkelaarii.*
dubius: *Echinocereus dubius.*
Dumortieri: *Lemaireocereus Dumortieri.*
eburneus: *Lemaireocereus griseus.*
Emoryi: *Bergerocactus Emoryi.*
Engelmannii: *Echinocereus Engelmannii.*
enneacanthus: *Echinocereus enneacanthus.*
eriophorus: *Harrisia eriophora.*
eruca: *Machærocereus eruca.*
euphorbioides: *Cephalocereus euphorbioides.*
Fendleri: *Echinocereus Fendleri.*
flagelliformis: *Aporocactus flagelliformis.*
gemmatus: *Pachycereus marginatus.*
geometrizans: *Myrtillocactus geometrizans.*
giganteus: *Carnegiea gigantea.*
gracilis: *Harrisia gracilis.*
grandiflorus: *Selenicereus grandiflorus.*
Greggii: *Peniocereus Greggii.*
gummosus: *Machærocereus gummosus.*
hamatus: *Selenicereus hamatus.*
lamprochlorus: *Trichocereus lamprochlorus.*
Lemairei: *Hylocereus Lemairei.*
Macdonaldiæ: *Selenicereus Macdonaldiæ.*
macrogonus: *Trichocereus macrogonus.*
mamillatus: *Echinocereus mamillatus.*
marginatus: *Pachycereus marginatus.*
Martianus: *Aporocactus Martianus.*
Martinii: *Harrisia Martinii.*
mojavensis: *Echinocereus mojavensis.*
monacanthus: *Hylocereus monacanthus.*
Nickelsii: *Cephalocereus polylophus.*
nycticallus: *Selenicereus pteranthus.*
obtusangulus: *Epiphyllanthus microsphæricus.*
ocamponis: *Hylocereus ocamponis.*
octacanthus: *Echinocereus octacanthus.*
pasacana: *Trichocereus pasacana.*
paucispinus: *Echinocereus triglochidiatus.*
pecten-aboriginum: *Pachycereus pecten-aboriginum.*
pectinatus: *Echinocereus pectinatus.*
pentagonus: *Acanthocereus pentagonus.*
pentalophus: *Echinocereus pentalophus.*
phoeniceus: *Echinocereus coccineus.*
polyacanthus: *Echinocereus polyacanthus.*
polylophus: *Cephalocereus polylophus.*
Poselgeri: *Wilcoxia Poselgeri.*
Pringlei: *Pachycereus Pringlei.*
procumbens: *Echinocereus pentalophus.*
pteranthus: *Selenicereus pteranthus.*
Reichenbachianus: *Echinocereus Reichenbachii.*
repandus: *Harrisia gracilis.*
Roemeri: *Echinocereus coccineus* and *E. octacanthus.*
rostratus: *Selenicereus hamatus.*
senilis: *Cephalocereus senilis.*
serpentinus: *Nyctocereus serpentinus.*
setaceus: *Mediocactus coccineus.*
Silvestrii: *Chamæcereus Silvestrii.*
Spachianus: *Trichocereus Spachianus.*
speciosissimus, speciosus: *Heliocereus speciosus.*
spinulosus: *Selenicereus spinulosus.*
splendens: *Monvillea Cavendishii.*
stellatus: *Lemaireocereus stellatus.*

stenopterus: *Hylocereus stenopterus.*

stramineus: *Echinocereus stramineus.*

testudo: *Deamia testudo.*

texensis: *Echinocereus Reichenbachii* and *E. papillosus.*

thelegonus: *Trichocereus thelegonus.*

Thurberi: *Lemaireocereus Thurberi.*

tortuosus: *Harrisia tortuosa.*

triangularis: *Hylocereus triangularis.*

tricostatus: *Hylocereus undatus.*

triglochidiatus: *Echinocereus triglochidiatus.*

tuberosus: *Wilcoxia Poselgeri.*

undatus: *Hylocereus undatus.*

viridiflorus: *Echinocereus viridiflorus.*

Weberi: *Lemaireocereus Weberi.*

CERIMAN: *Monstera deliciosa.*

CERINTHE. Honeywort. *Boraginaceæ.* Old World herbs, often glabrous and glaucous, with alternate simple lvs. and yellow fls. among leafy bracts in terminal racemes or cymes; ovary in 2 parts but style undivided. Of easy cult. Propagated by seeds.

major. Ann. to 1 ft.: lvs. rough and ciliate: fls. purplish at top, the bracts showy. Medit. region.

retorta. Ann. to 2 ft.: lvs. glaucous, often spotted with white or red: fls. tipped with purple, the bracts purple. Greece.

CERNUOUS: drooping; declining somewhat from the perpendicular.

CEROPEGIA. *Asclepiadaceæ.* Herbs or subshrubs, sometimes twining, with opposite lvs. (sometimes lacking) and tubular fls. mostly in axillary clusters; corolla tubular and often inflated at base, crown joined to the staminal tube; follicles slender; native in trop. Asia, Afr. and Malaya, one grown in the greenhouse.

They grow in soil composed of loam, leaf-mold or peat, and sand. Propagated by cuttings in spring over bottom heat.

Woodii. Sts. trailing or prostrate: lvs. heart-shaped, to ⅝ in. long: fls. light-purple or pink, to ¾ in. long, usually 2 together. Natal.

CEROPTERIS: *Pityrogramma.*

CEROXYLON. *Palmaceæ.* Tall unarmed feather-palms of Colombia and Ecuador, monœcious or polygamous, with long paniculate spadices among the lvs.; species perhaps 5: lvs. terminal, making a heavy crown: fls. large; stamens 9–15: fr. a red or purplish berry, 1 in. or less diam. For cult. see *Palm.*

andicola. Wax Palm. Very tall, the trunk ringed and incrusted with wax, swollen at or above the middle: lvs. to 20 ft. long; pinnæ many, linear, acuminate, bifid at apex, deep green above, densely silvery-tomentose underneath: fr. purplish.—This tree has been intro. into S. Calif., but with only indifferent success.

CERVICINA: *Wahlenbergia.*

CESPITOSE, CÆSPITOSE: matted; growing in tufts or dense clumps; said of low plants that make mats or turf of their basal growths.

CESTRUM. *Solanaceæ.* Shrubs and small trees grown in warm countries and under glass in northern latitudes for the axillary or terminal cymes of bright small tubular mostly fragrant fls., red, yellow, greenish or white, blooming from Jan. to Apr.: lvs. simple, entire and usually narrow, deciduous or persistent: fr. a small berry: native in American tropics.

Propagated by cuttings in February or early March and kept in a warm temperature; also by seed when obtainable.

aurantiacum. Half-climbing shrub: lvs. oval, to 4 in. long: fls. in a terminal panicle, orange-yellow, 1 in. long, the lobes strongly reflexed. Guatemala.

coccineum: hort. name for the color form of *C. fasciculatum.*

diurnum. Day-Jessamine. Shrub to 15 ft.: lvs. oblong or oval, to 3½ in. long, thick and evergreen, glossy above: fls. white, ½ in. long, the lobes reflexed, fragrant by day, in short clusters on long axillary sts. W. Indies.—Frequently planted far S. even along the coast.

elegans (*Habrothamnus elegans*). Shrub to 10 ft. or more, somewhat climbing, branches soft-hairy: lvs. ovate to ovate-lanceolate, to 4 in. long and 1½ in. wide: fls. in loose terminal more or less nodding clusters, to 1 in. long, red-purple, constricted at throat, of continuous bloom: berries red. Mex. Var. **Smithii** (*C. Smithii*), fls. blush-rose. There is also a variegated form.

fasciculatum. Differs from *C. elegans* in the broader lvs. to 2½ in. wide, larger purplish-red fls. in compact clusters usually subtended by lvs. Mex. Var. **Newelli** (*C. Newelli*), fls. crimson, large, free-blooming.

Newelli: *C. fasciculatum* var.

nocturnum. Night-Jessamine. Shrub to 12 ft.: lvs. oblong-ovate or oval, to 8 in. long, more or less shining on both sides: fls. greenish-white to cream-colored, ¾ in. long, the pointed lobes erect or spreading, very fragrant at night, in axillary clusters, blooming at intervals throughout the year. W. Indies.

Parqui. Willow-leaved Jessamine. Shrub to 6 ft.: lvs. lanceolate, to 6 in. long: fls. greenish-white to greenish-yellow, 1 in. long, the pointed lobes spreading, fragrant at night, in profuse axillary and terminal clusters. Chile; probably the hardiest.

Smithii: *C. elegans* var.

CHÆNOMELES. Flowering Quince. *Rosaceæ.* Deciduous or semi-evergreen shrubs native in E. Asia, with alternate toothed lvs., solitary or clustered showy waxy fls. in early spring before the lvs., and fr. a hard quince-like pome. Often listed as Cydonia.

These are attractive ornamental subjects and hardy North except *C. sinensis*, and this fruits on Long Island and in similar climates. The fruits of some kinds are also used sparingly for making preserves. Propagated by seeds stratified and sown in spring, by root-cuttings or cuttings of half-ripe wood under glass, by layers, and rare kinds by grafting on *C. lagenaria* or *Cydonia oblonga.*

japonica (*C., Pyrus,* and *Cydonia Maulei. Pyrus japonica*). Dwarf Japanese Quince. To 3 ft., with spiny branches: lvs. broad-ovate, to 2 in. long, coarsely toothed: fls. orange-scarlet, to 1½ in. across, clustered, Mar.–Apr.: fr. yellow, 1½ in. long. Japan. Var. **alpina** (*Cydonia Sargentii*) has procumbent sts. and lvs. to 1 in. long.

lagenaria (*Cydonia japonica* of horticulturists). Japanese Quince. To 10 ft., with spiny branches: lvs. oblong, to 3 in. long, finely toothed, shining above: fls. scarlet-red, to 2 in. across, clustered, Mar.–Apr.: fr. greenish-yellow, to 2 in. long. China. Var. **alba**, fls. nearly white; var. **Baltzii**, fls. rosy-pink; var. **cathayensis**, lvs. lanceolate; var. **grandiflora**, fls. large, nearly white; var. **Moerloosei**, fls. white, striped with pink; var. **roseo-pleno**, fls. rose, partially double; var. **rubra grandiflora**, fls. deep crimson, large; var. **sanguinea plena**, fls. scarlet, double; var. **umbilicata**, fls. rose-red; var. **Wilsonii**, lvs. tomentose beneath, fls. salmon-pink.—This, in its many forms, is the commonly cult. Japanese quince, and formerly supposed to be the plant originally intended to bear the name *japonica.*

Maulei: *C. japonica.*

sinensis (*Cydonia,* and *Pseudocydonia, sinensis*). Chinese Quince. To 20 ft., spineless: lvs. elliptic, to 3 in. long, sharp-toothed, semi-evergreen: fls. light pink, solitary, to 1½ in. across, May: fr. yellow, to 7 in. long, woody, aromatic. China.

superba. Hybrid between *C. japonica* and *C. lagenaria*: fls. blood-red.

CHÆNOSTOMA. *Scrophulariaceæ.* S. African herbs and subshrubs with opposite lvs., white, yellow or reddish tubular fls. with 4 exserted stamens, and capsular frs.

Certain low kinds are grown out-of-doors in southern United States and in the greenhouse for the profuse small bloom and compact habit; useful for edgings. Propagated by seeds or cuttings.

fastigiatum (*Sutera cephalotes*). Per. to 1 ft.: lvs. oblong, about ½ in. long, with few teeth toward apex: fls. ½ in. long, in head-like racemes.

hispidum (*Sutera brachiata*). Per. or subshrub to 2 ft., hairy: lvs. oval to oblong, to 1¼ in. long, entire: fls. pink or whitish, to ⅓ in. long, in leafy racemes.

polyanthum (*Sutera polyantha*). Ann. to 1 ft.: lvs. ovate to lanceolate, to 1¼ in. long, toothed: fls. bluish-lilac, ¼ in. long, in racemes.

CHÆROPHYLLUM. *Umbelliferæ.* Herbs with pinnately or ternately compound lvs., small white fls. in compound umbels, and flattened frs.; one species is grown for the edible root. See *Chervil.*

bulbosum. Turnip-rooted Chervil. Bien. to 3 ft., with gray or blackish tuberous root having yellowish-white flesh: lvs. decompound into linear segms. Eu.

CHÆTOCHLOA: *Setaria.*

CHÆTOSPERMUM: *Swinglea.*

CHAFF: a small, thin, dry and membranous scale or bract; in particular, the bracts in the flower-heads of composites.

CHALCAS: *Murræa.*

CHALICE-VINE: *Solandra.*

CHAMÆCEREUS. *Cactaceæ.* One species, Argentina, forming little clumps of cylindric plant bodies or joints that are 2 in. or so long with 6–9 ribs and soft white spines. **C. Silvestrii** (*Cereus Silvestrii*) resembles some of the creeping kinds of Echinocereus, with orange-scarlet diurnal solitary fls. nearly 3 in. long, the tube narrow and stamens included: fr. small, globular, woolly.

CHAMÆCRISTA: *Cassia cinerea.*

CHAMÆCYPARIS. False-Cypress. *Pinaceæ.* Large evergreen trees of pyramidal habit, mostly attaining 100 ft. or more in native habitats, with scale-like lvs. densely clothing the branchlets, appressed on old branches, spreading and needle-like on young growth, yellow (or red in *C. Lawsoniana*) staminate fls., and small globose cones of peltate scales bearing a point or prominence in middle; species few, in northern hemisphere. For cult. see *Conifers.* Excellent in cult. as small trees, ornamental and most of them hardy in the northern parts of the country, and widely variable. Retinisporas (or retinosporas) are juvenile forms of Chamæcyparis and Thuja.

formosensis. Branches drooping at tips: cones to ⅓ in. across. Formosa.—Not to be confused with *C. obtusa* var. *formosana.*

Lawsoniana (*Cupressus Lawsoniana*). Branches usually drooping, the branchlets frond-like: lvs. obtuse, with indistinct white markings below: cones ⅓ in. across. Ore., Calif.; hardy in latitude of central states and some of the forms stand in sheltered positions in S. New England; much grown in warm regions and greatly prized in its many very ornamental forms. Some of the hort. vars. are: **albo-spica,** Cream C., branchlets creamy-white at tips; **Allumii,** Scarab C., columnar form with very glaucous foliage; **argentea,** foliage silvery; **aurea,** foliage golden-yellow when young; **Bowleri,** compact form with branchlets drooping at tips; **darleyensis,** low form with lvs. slightly golden-yellow; **erecta** (var. *erecta viridis*), columnar form with bright green lvs. or glaucous in its form **glauca**; **filiformis,** branchlets drooping; **Fletcheri,** dense columnar form with glaucous lvs.; **Forsteckiana,** branchlets twisted into cockscomb-like heads, **Fraseri,** columnar form with dark blue lvs.; **glauca,** lvs. steel-blue; **gracilis,** branchlets drooping, lvs. light green; **intertexta,** pyramidal form with bluish-green lvs.; **Krameri,** of thin habit with slender whip-like branches; **lutea,** young growth bright yellow; **lycopodioides,** with irregular branches and twisted branchlets; **minima glauca,** dwarf form with steel-blue lvs.; **nana,** of dwarf globose habit, and its form **glauca** with lvs. bluish-green; **patula,** compact, branches spreading, lvs. glossy dark green; **pendula,** branchlets drooping and its form **vera** with branches also drooping; **pyramidalis,** columnar and its form **alba** with young growth white; **Westermanni,** of stiff pyramidal habit, lvs. light yellow; **Wisseli,** of columnar habit, with glaucous lvs.; **Youngii,** vigorous upright form. Other listed names under this species are: *Drummondii, elegans, elegantissima, lutescens, monumentalis* and *glauca, Rosenthalii, semper-horizontalis, stricta* and *cærulea, sulphurea, tortuosa, versicolor.*

leptoclada: *C. thyoides* var. *andelyensis.*

nootkatensis (*Cupressus nootkatensis. Thujopsis borealis*). Nootka C. Branchlets drooping: lvs. acute, dark green, without white markings: cones ½ in. across. Alaska to Ore.; hardy N., but should have protection from winter winds. Var. **compacta,** dwarf and compact; **glauca,** lvs. very glaucous; **lutea,** young growth light yellow; **pendula,** branches drooping. A form *viridis* is also listed.

obtusa (*Retinispora* and *Cupressus obtusa*). Hinoki C. Branchlets flattened and frond-like, drooping: lvs. obtuse, glossy above and with whitish lines beneath: cones ½ in. across. Japan. Some of the hort. vars. are: **albo-spicata,** shoots creamy-white when young; **aurea,** lvs. golden-yellow when young and its form **Youngii** with more drooping branchlets: **breviramea,** pyramidal form with short branches: **compacta,** dwarf broad form; **Crippsii,** lvs. pale yellow; **erecta,** branches ascending; **ericoides,** low form with linear bluish-gray lvs.; **filicoides,** branchlets short and frond-like; **filiformis,** branches thick and thread-like, drooping; **formosana,** with slenderer branchlets and smaller cones, Formosa; **gracilis,** pyramidal form with dark green lvs. or in **aurea** bright yellow when young; **lycopodioides,** of dwarf shrubby habit; **magnifica,** vigorous form; **nana,** of low growth and in **aurea** golden-yellow when young; **pendula,** drooping habit; **pygmæa,** very dwarf form with almost creeping branches; **tetragona,** dwarf form with 4-angled branchlets, partly golden-yellow. Other listed names are *acuta* and *decussata.*

pisifera (*Retinispora* and *Cupressus pisifera*). Sawara C. Branchlets flattened and slightly drooping: lvs. acuminate, glossy above and with whitish lines beneath: cones to ⅓ in. across. Japan; likely to suffer in exposed places N. There are many hort. vars. as: **aurea,** lvs. golden-yellow; **filifera,** branches thread-like, drooping, and its forms **aurea** with young growth golden-yellow, and **aureo-variegata** with branchlets variegated yellow; **plumosa,** dense conical habit with feathery branchlets, and its forms **argentea** with tips of branchlets whitish, **aurea** with young growth golden-yellow, and **flavescens** with tips of branchlets yellowish; **squarrosa,** Moss R., bushy habit with feathery branchlets, and its form **dumosa** of more compact and slower-growing habit, and **sulphurea** with yellow lvs., *Veitchii* and *Sieboldi* are listed under this var.; **sulphurea,** lvs. light yellow.

sphæroidea: *C. thyoides.*

texana glauca: a listed name.

thyoides (*C. sphæroidea. Cupressus thyoides*). White-Cedar. Branchlets flattened, not drooping: lvs. acute, light green or glaucous: cones ¼ in. across. Me. to Fla. and Miss., hardy near coast. Hort. vars. are: **andelyensis** (*C. leptoclada*), of upright habit with loosely appressed lvs.; **ericoides,** Cedar R., dense shrub with spreading lvs. having 2 glaucous lines beneath; **glauca,** lvs. nearly silvery-white; **Hoveyi,** of slender habit, the branchlets with dense terminal tufts; **variegata,** branchlets variegated yellow.

CHAMÆDAPHNE. *Ericaceæ.* One evergreen shrub to 5 ft., native in bogs in N. Eu.,

N. Asia and N. Amer. **C. calyculata** (*Andromeda* and *Cassandra calyculata*). Leather-Leaf. Lvs. alternate, oblong, to 2 in. long, rusty-scaly beneath: fls. white, urn-shaped, nodding, ¼ in. long, in racemes to 5 in. long, Apr.–June. Var. **nana,** to 1 ft. — A good shrub for the rock-garden where it does best in a moist soil of sand and peat. Propagated by seeds only slightly covered, by cuttings of ripe wood under glass, by layers and suckers.

CHAMÆDOREA. *Palmaceæ.* Small thin-lvd. shade-loving unarmed diœcious or seldom monœcious palms, Mex. to S. Amer., with solitary or clustered reed-like ringed or jointed or sheathed sts., sometimes climbing, and pinnate, pinnatisect or pinnate-veined lvs., probably more than 60 species: spadices among the lvs. or below them, simple and cord-like or paniculately branched and with slender parts, the spathes usually prominent; stamens 6; pistillate fls. very small and often sunken in pits: fr. small, of 1–3 globose or oblong carpels, purplish or red or orange. The Chamædoreas are imperfectly known botanically; the identity of the cult. kinds is perplexing inasmuch as the two sexes may not be grown together and as fr. is little known. They are attractive neat green-stemmed palms for porch and patio use where protection may be provided from winds and burning sun, in S. Calif. and S. Fla.; well adapted to lath houses. For cult. see *Palm.*

Arenbergiana. St. erect, 5–6 ft., remotely ringed: lvs. pinnate, recurved at apex; pinnæ 16–30, long-oblong and falcate, very long-acuminate, the apex pendulous, primary nerves 9: spadices below the lvs.: fr. subglobose, in a dense cluster. Cent. Amer.

bambusoides: listed name.

corallina. St. solitary, sheathed and not ringed, to 4 ft. or more: spadices among the lvs., the pistillate divaricately branched: lvs. pinnate, green both sides but lighter underneath, 2 ft. or more long; pinnæ 8–12 in. long, broad-oblong and abruptly long-pointed, 3 in. broad at middle, the terminal one confluent and bifid and many-ribbed, lateral ones with 1 prominent rib off-center and many secondary ones. Venezuela.

desmoncoides. Climbing with age, with long slender sts.: lvs. pinnate, 2–3 ft. long; pinnæ 12 in. long, narrow, drooping; petiole glaucous. Mex.

elatior (*C. scandens*). Slender and more or less climbing, the st. covered with petiole-sheaths: st.-lvs. pinnate, 6–8 ft. long, sheath 18 in. long; pinnæ 2 ft. long, 1 in. broad, long-acuminate, strongly several-nerved. Mex.

elegans. Apparently the commonest chamædorea in cult.: sts. solitary or clustered, with many rings or nodes, 6–8 ft.: lvs. pinnate; pinnæ narrow-lanceolate and long-acuminate, green both sides, rather soft in texture, not ridged: spadix much branched. Mex.

Ernesti-Augusti. St. solitary, slender, ringed, with brace-roots at base: lvs. simple; blade obovate or ovate-oblong, 1½ ft. long and half as broad, bifid at apex to half or more the depth, strongly many-ribbed, the margins bluntly dentate; sometimes the lf. is pinnate, with a broad bifid terminal lobe and many-ribbed lateral pinnæ 1–2 in. broad: fertile spadix simple; staminate erect, branched: fls. reddish. Mex.

fragrans. St. 4–6 ft., scarcely 1 in. thick, ringed: lvs. mostly 5 or 6, 1 ft. long, 2-lobed below the middle, each lobe long-acuminate and many-nerved: fls. fragrant: fr. elliptic, black-purple. Peru.

geonomæformis. St. solitary, sheathed, about 4 ft.: lvs. simple, oblong, 8–12 in. long, 5 or 6 in. broad, deeply bifid, deep green, about 12 nerves on either lobe: staminate spadix from st. just below the lvs., with several long drooping branches 8–10 in. long. Guatemala.

glaucifolia. St. tall, to 20 ft., solitary, ringed remotely: lvs. pinnate, 4–6 ft. long, glaucous on both sides; pinnæ 70–80, long and slender, very long-acuminate: spadix tall, erect or ascending, among the lvs., on slender elongated peduncle. Guatemala.

graminifolia. St. remotely ringed: lvs. pinnate, erect, dark green; pinnæ about 40, rather close together, linear-lanceolate, very long-acuminate, spreading horizontally, strongly several-nerved: staminate spadix erect, with long pendulous branches. Guatemala.

Martiana. St. short, creeping, dwarf and spreading, with many forking sts.: lvs. pinnate; pinnæ many, linear, pendent, 6–8 in. long. Mex.

oblongata. St. ringed: lvs pinnate, at apex pinnæ confluent and commonly truncate and erose but otherwise oblong or falcate-acuminate: pistillate spadix erect, much branched: fr. oblong, black. Mex.

Pacaya. St. slender and erect, 8–10 ft., remotely ringed: lvs. erect-spreading, 2–3 ft. long; pinnæ about 7, dull green, plicate, middle ones 7–8 in. long and 1½ in. broad, long-acuminate, the terminal ones very broad and serrate on outer margins: fertile spadix about 20 in. long, with flattened peduncle compressed below to caudex, the branches 5 or 6 and 3–4 in. long: fr. oblique-obovoid, about ⅓ in. long. Costa Rica.

Pringlei. Nearly or quite stemless: lvs. pinnate, erect, firm in texture, 3 ft. long; pinnæ 25–30, widely spaced, linear-lanceolate and very long-acuminate, 6–8 in. long and ⅓ in. or less broad, strongly nerved: spadix simple. San Louis Potosi, Mex.

Sartorii. St. 8–14 ft., solitary, ringed and above covered with lf.-sheaths: lvs. pinnate, 3 ft. long, rather soft; pinnæ about 15, broad-lanceolate, 10–12 in. long and to 2½ in. broad, abruptly acuminate, with 1 mostly off-center rib and several secondary ones, the upper ones more or less confluent at base: spadices with and below the lvs., simply branched, the staminate with long pendulous branches. Mex.

scandens: *C. elatior.*

Tepejilote. St. to 10 ft., solitary, strongly and rather closely ringed, with swollen joints: lvs. pinnate, to 4 ft. long; pinnæ 20–30, about 1–1½ ft. long, 1½–2 in. broad, long-acute: spadices below the lvs., with a sheathed peduncle, simply branched, the staminate branches long-drooping. Mex.

Wendlandiana. St. stout, solitary, a few ft., ringed: lvs. pinnate, large, strongly ascending, to 4 ft.; pinnæ 36–40, narrow-lanceolate, 1½ ft. long and to 2 in. broad, long-acuminate, with several or many very strong light-colored ribs: spadix on the trunk, the staminate with many and the pistillate with few branches. Mex.

CHAMÆLAUCIUM. *Myrtaceæ.* Australian heath-like shrubs with mostly small opposite lvs., 5-parted fls. borne in axils or short terminal racemes, the stamens 10; one species planted in Calif.

ciliatum. To 2 ft.: lvs. terete or 3-angled, to ¼ in. long: fls. about 1/12 in. long, axillary, the calyx-lobes fringed.

CHAMÆLIRIUM. *Liliaceæ.* One per. herb with tuberous roots, native from Mass. to Fla. and Ark., sometimes planted in shady situations in the garden. **C. luteum.** Blazing Star. Fairywand. To 4 ft.: lvs. to 8 in. long and 1½ in. wide: fls. yellowish-white, small, diœcious, in spike-like racemes.

CHAMÆNERION: *Epilobium angustifolium.*
CHAMÆPERICLYMENUM: *Cornus canadensis.*
CHAMÆPEUCE: *Cirsium Diacantha.*

CHAMÆROPS. *Palmaceæ.* One low bushy diœcious (or polygamous) fan-palm in the Medit. region, the only palm native in Eu., and much planted where a hardy small species is required and under glass: very variable, and several specific names have been applied to the forms. Plant usually suckering and making a clump but growing to a single trunk in some forms and when sprouts are removed: spadices among the lvs. and shorter than they, short-branched, not pendent; stamens 6–9: fr. ovoid, oblong or globose (depending on the var.), drupe-like, ½–1½ in. long, with somewhat succulent exterior, brown or yellow; one group of vars. has ovoid or oblong frs., and another group has nearly or quite spherical frs. Trachycarpus was formerly included in this genus. See *Palm.*

argentea. Glaucous-blue form of *C. humilis.*

excelsa: see *Trachycarpus.*

Fortunei: see *Trachycarpus.*

humilis. Usually with trunks only 3–5 ft. tall, but sometimes to 20 ft. or more in arborescent forms: lvs. relatively small, mostly 2–3 ft. across, stiff, green or glaucous-blue, with many narrow bifid segms. extending nearly to the base; petiole long and slender, strongly long-spined.—Easily grown; hardy along the Gulf Coast and somewhat northward; propagated by seeds and suckers. There are a number of named vars., differing in stature, lvs. and fr., but hardly distinguishable as species.

macrocarpa. A large-fruited var. of *C. humilis*: fr. spherical, ¾ in. diam.

Ritchieana: *Nannorrhops Ritchieana.*

stauracantha: *Acanthorhiza Mocinni.*

CHAMBEYRONIA. *Palmaceæ.* Two recognized monœcious unarmed tall handsome feather-palms of New Caledonia, more or less confused in cult. and usually known as Kentia or Kentiopsis; the name *Kentia Lindenii* appears to have been applied to both species. From Kentiopsis the genus differs in technical characters of the larger fr., and the indefinite (rather than definite, say 20 or less) number of stamens.

macrocarpa (*Kentia* and *Kentiopsis macrocarpa*). Tall tree, attaining 60 ft. and more: lvs. large, reddish underneath when young but becoming nearly equally green both sides; pinnæ many, 3–4 in. broad, equidistant on rachis, with strong rib on margin as well as midrib and prominent intermediate nerves: spadix below the crown, branched, glabrous; fls. normally in 3's, center one pistillate or all staminate toward end of branches; staminate fls. about ⅜ in. long, stamens numerous: fr. ovoid-elliptic, about 1½ in. long, in a shallow cup-like enlarged perianth.—C. Hookeri has lvs. paler underneath: staminate fls. larger: fr. long-ellipsoid, about 2 in. long, the perianth deeply cup-like.—Grown under glass, probably adapted to S. Fla.

CHAMISO: *Adenostoma.*

CHAMOMILE: *Matricaria, Anthemis nobilis.*

CHAMOMILLA: *Matricaria.*

CHARD, SWISS: see *Beta.*

CHARIEIS. *Compositæ.* One ann. herb in S. Afr., sometimes grown in flower-gardens and of easy cult. **C. heterophylla** (*C. Neesii. Kaulfussia amelloides*). To 1 ft., hairy: lvs. oblong, entire, to 2½ in. long: heads solitary and long-stalked, ¾ in. across, rays blue, disk yellow or blue; pappus plumose.

CHARITY: *Polemonium cæruleum.*

CHARLOCK: *Brassica arvensis.*

CHASTE-TREE: *Vitex Agnus-castus.*

CHAULMOOGRA: see *Taraktogenos.*

CHAYOTE (*Sechium edule*, which see for botanical description). A cucurbit grown for the edible fruits and root tubers, native in tropical America, widespread in the western tropics as a cultivated plant and adaptable also to the coastal parts of the United States from South Carolina southward and in southern California; in regions in which the ground does not freeze more than an inch or so deep the roots survive the winter if given protection. If grown only as an annual each year from seed, the plant may be raised to fruiting stage farther north, although a long season is required. Two or more plants should be grown to insure pollination.

The chayote is propagated from seed, the entire ripe fruit being planted in spring, or perhaps in autumn in southern Florida; the fruit is placed with the broad end sloping downward and the stem end slightly exposed. There is one seed in a fruit. The plants are started where they are to stand, and they should be 8–12 feet apart and trellis or other support provided. Special or named varieties are propagated by cuttings of shoots taken at the crown of the plant, and struck under glass or other protection. If the soil is fertile, a plant should produce 50 to 100 or more fruits in a season. The fruits are boiled, and prepared in various ways for eating. In tropical countries the large root tubers are eaten after the manner of potatoes; the tubers are usually harvested after the second year's growth. If tubers are left in the ground in regions where they do not freeze, the plant is of course perennial. The chayote fruit is much prized in tropical America, where it may be known also as christophine and chuchu, and in some places as mirliton and vegetable-pear. The herbage supplies good forage, and the young parts are sometimes used after the manner of asparagus and spinach.

CHECKERBERRY: *Gaultheria procumbens.*

CHECKERBLOOM: *Sidalcea malvæflora.*

CHEILANTHES. LIP-FERN. *Polypodiaceæ.* Small rock-loving greenhouse or semi-hardy ferns, often hairy or woolly: lvs. 1–3-pinnate; sori terminal on veins: widely distributed in temp. and trop. regions, where they do best in dry rocky situations. Under glass the foliage should be kept dry. See *Ferns.*

alabamensis. Lvs. to 10 in. long, 2-pinnate, nearly glabrous, on black stipes to 7 in. long. Va. to Ala. and Ariz.

Covillei. Lvs. tufted, to 4 in. long, 3-pinnate, densely covered beneath with white or brown scales, on brown or purplish stipes to 7 in. long. S. Calif., Nev., Ariz.

densa (*C. siliquosa. Pellæa densa. Cryptogramma densa*). Lvs. to 3 in. long, 3-pinnate, glabrous, margins of segms. revolute, on shining brown stipes to 9 in. long. W. N. Amer.

Fendleri. Lvs. to 10 in. long, 3-pinnate, brown-scaly beneath not tomentose, on brown stipes. Tex., Colo., Ariz.

lanosa. Lvs. to 9 in. long, 2-pinnate, densely rusty-hairy, on brown stipes to 4 in. long. Conn. to Ga. and Tex.

myriophylla. Lvs. densely tufted, to 9 in. long, 3–4-pinnate, densely scaly and woolly beneath, on brown stipes. Mex. to S. Amer.

siliquosa: *C. densa.*

tomentosa. Lvs. to 1½ ft. long, 3-pinnate, covered all over with brownish-white hairs, on stout brown tomentose stipes to 8 in. long. Va. to Ariz. and Mex.

CHEIRANTHUS. *Cruciferæ.* A few perennials, sometimes woody at base, native from the Canary and Madeira Isls. to the Himalayas, one of them an old garden plant, and others sometimes planted for ornament. Plants more or less grayish-pubescent: lvs. narrow, nearly or quite entire: fls. for the most part yellow or orange, sometimes brownish: pod or silique long, angled.

The usual species in cultivation is the wallflower, *C. Cheiri.* It is a spring-blooming low erect perennial, much like stock but the colors in yellow, yellow-brown, red to red-black, much prized in Europe (where it is native) but less popular in this country. It requires a cool season for best bloom, and in the northern United States the maiden plants must usually be carried over in a frame. In England they are frequent inhabitants of fence-walls and quarries. The free flowering, rich deep colors, and pleasant fragrance make wallflowers good subjects for very early spring bloom, or for winter bloom in mild climates. Special colors are propagated by means of cuttings. Usually they are grown from seeds; plants should be strong and bushy to go through the winter well. Seeds may be sown early in the year, the plants transplanted once or twice, and be ready for bloom the following spring. If wanted for bedding-out, they may be carried over winter dormant in pots, and turned out as soon as the ground is open. Plants started in late spring or early summer may make satisfactory spring-blooming subjects if the season and all other conditions turn out favorable to them, but it is better to sow seeds earlier. Good plants may be purchased of dealers. Some of the strains give bloom the first year from seeds, started early, the plants being practically annual.

Allionii of gardens: see *Erysimum asperum.*

Cheiri. Wallflower, discussed above. To 2½ ft., strongly erect: lvs. lanceolate or narrower, acute, to 3 in. long: fls. to 1 in. long, fragrant, yellow to yellow-brown. S. Eu.

kewensis. Bushy per, with upright racemes: fls. about 1 in. across, brownish-orange inside and reddish-brown outside, becoming pale purple. Hybrid.

linifolius: *Erysimum linifolium.*

Senoneri. Per., woody, much branched, with curved parts: lvs. ovate-oblong and entire or short-toothed: fls. orange, fragrant. Greece.

CHEIRINIA: *Erysimum asperum.*

CHELIDONIUM. Celandine. *Papaveraceæ.* One weedy bien. or per. herb with orange-colored juice, sometimes grown in wild-gardens. Propagated by seeds or division of roots. **C. majus.** To 4 ft.: lvs. deeply pinnatifid, glaucous beneath: fls. yellow, to ⅔ in. across, in small umbels, sometimes double: fr. linear, to 2 in. long. Eu.; nat. in E. N. Amer. Var. **laciniatum** has more finely divided lvs. See *Dicranostigma* for *C. Franchetianum.*

CHELONE. Turtle-Head. *Scrophulariaceæ.* Hardy herbaceous perennials, closely allied to Penstemon, with showy 2-lipped or gaping fls. in dense axillary or terminal spikes, in summer: lvs. opposite and toothed: native in N. Amer.

These plants thrive in partial shade and in soil not too dry as they are native mostly in swampy places and damp woods. Propagated by seed or by division.

barbata: *Penstemon barbatus.*

glabra. White T. Snake-Head. To 3 ft.: lvs. lanceolate, to 6 in. long, short-petioled: fls. white or pinkish, 1 in. long. Newf. to Ga. and Minn.

Lyoni. To 3 ft.: lvs. ovate, to 7 in. long, long-petioled: fls. rose-purple, 1 in. long. Mts. N. C., S. C. and Tenn., but hardy N. There is a lower or dwarf form.

nemorosa: *Penstemon nemorosus.*

obliqua. To 2 ft.: lvs. oblong, to 8 in. long, very veiny, petioled: fls. deep rose, 1 in. long. Md. to Ill., Fla. and Miss.

Pentstemon: *Penstemon lævigatus.*

CHENILLE PLANT: *Acalypha hispida.*

CHENOPODIACEÆ. Goosefoot Family. Herbs or shrubs of about 75 widespread genera, many of them weedy but a few grown as vegetables and for ornament. Family characterized by mostly alternate simple lvs. and small inconspicuous bisexual or unisexual fls. having no petals, 2–5-lobed calyx or sometimes lacking, 2–5 stamens, usually superior 1-celled ovary, and fr. a utricle or achene. Those herein treated are Atriplex, Beta, Camphorosma, Chenopodium, Enchylæna, Eurotia, Kochia, Rhagodia, Salicornia, Salsola, Spinacia.

CHENOPODIUM. Goosefoot. Pigweed. *Chenopodiaceæ.* Mealy or glandular herbs or subshrubs with alternate lvs. and small greenish bisexual fls. in spikes or panicles; mostly weedy, but a few grown as pot-herbs and for ornament, and one is medicinal. Of easy cult. Propagated by seed.

album. Lambs-Quarters. Ann. to 10 ft.: lvs. rhombic-ovate to lanceolate, to 4 in. long, entire, toothed or lobed, often white-mealy beneath. Eu., Asia, N. Amer. —Sometimes collected for greens.

amaranticolor. Ann. to 8 ft.: lvs. triangular-ovate, to 4 in. long, irregularly toothed and notched, violet-red toward top of plant. Original habitat unknown.

ambrosioides. American Wormseed. Mexican-Tea. Ann. or per. to 3½ ft., strong-smelling: lvs. ovate to lanceolate, to 5 in. long, coarsely toothed or cut. Trop. Amer.; nat. in N. Amer., Eu., Asia.—Has medicinal properties.

Atriplicis: *C. purpurascens.*

Bonus-Henricus. Good King Henry. Mercury. Per. to 2½ ft.: lvs. arrow-shaped, to 3 in. and more long, entire. Eu., nat. in E. N. Amer.—Grown as pot-herb.

Botrys. Feather-Geranium. Jerusalem-Oak. Ann. to 2 ft., glandular-pubescent and strong-smelling: lvs. oval to oblong, to 2 in. long, lobed or pinnatifid. Eu., Asia, Afr.; nat. in N. Amer.—The plant is sometimes cult. under the name *Ambrosia mexicana.*

capitatum (*Blitum capitatum*). Ann. to 1½ ft.: lvs. triangular-ovate, toothed: fls. in dense heads becoming berry-like in fr. Eu.—Sometimes grown for pot-herb.

purpurascens (*C. Atriplicis*). Ann. to 3 ft., covered with violet-purple crystalline pubescence: lower lvs. spatulate to oval and toothed, upper lanceolate and entire. China.

Quinoa. Quinoa. Ann. to 5 ft.: lvs. triangular-ovate, angular-toothed or pinnatifid. Andes.—The seeds are extensively eaten in S. Amer.

CHERIMOYA (*Annona Cherimola*). A South American small tree, cultivated in warm and subtropical regions for the delicious edible fruit, which is heart-shaped or conical and may sometimes weigh as much as five pounds. The flesh is white, soft and melting, containing bean-like seeds. It is a dessert fruit, with a subacid flavor somewhat suggestive of the pineapple. There are many varieties, and the failure to make a success in the growing of it is often due to inferior kinds. It should thrive in many regions where avocados can be grown. It is not strictly a tropical fruit, being native in more or less elevated regions, and requires a relatively dry climate. It should thrive in parts of southern California. It does not endure temperatures much below freezing without injury.

The cultivation of the cherimoya is similar to that of the citrus fruits. It is planted 20 to 30 feet apart. Choice varieties are multiplied by shield-budding or grafting on seedlings of cherimoya although other species of Annona may be employed as stocks. Trees begin to bear in three or four years after planting in the orchard. Probably the scant yield of some trees of cherimoya is the result of insufficient pollination.

CHERRY. The usual fruit-bearing cherries are of two species, the sweet cherry, *Prunus avium*, and the sour cherry, *Prunus Cerasus;* the duke cherries, with the habit of *P. avium* but bearing acid fruit, are *P. avium* var. *regalis*, by some investigators accounted hybrids between the two species. The dwarf cherries of the Plains region are *Prunus Besseyi*, a native species; this is sometimes employed as a stock for sour cherries in cold regions.

As to regions, the sweet and sour cherries differ markedly in their ability to succeed under a wide range of climatic and soil conditions. The sweet cherry is the much more restricted of the two and can be grown to advantage only in the more favored fruit regions which have an equable climate, as, for example, the Hudson Valley of New York, the shores of the Great Lakes and on the Pacific Coast. It is about as tender to injury from winter cold and late frosts as is the peach and does not endure heat as well. The sour cherry, on the other hand, can be grown over a much wider territory extending north of the sweet cherry belt and south into the Mississippi Valley and along the Atlantic Coast. The largest sour cherry plantings are in New York and Michigan.

Soils are of less importance than climate in cherry growing. Sour cherries thrive on most well-drained soils, either light or heavy, and withstand rather dry conditions. Sweet cherries are more exacting, and reach their best development in deep well-drained sandy or gravelly loams.

Propagation of both sweet and sour cherries is by budding on seedling stocks. The sweet cherry grows best on Mazzard stock although Mahaleb stocks are used in many cases with fair results. Sour cherries are commonly budded on the Mahaleb stock which is preferred by the nurserymen because it makes a better nursery tree. Mazzard stocks make better orchard trees.

Orchard treatment is not unusual. One- or two-year nursery trees are set in very early spring or, in the milder climates, in the late autumn. Sour cherries are placed about 18 x 18 feet, although 24 x 24 feet is better for the more vigorous sorts on good soil. Sweet cherries may be set 25 x 25 feet, or 30 x 30 feet in favorable situations. Sour cherries succeed best commercially under cultivation and cover-crops, as described for the apple, although in the home fruit-garden considerable fruit will be produced under sod or almost total neglect. Sweet cherries withstand sod culture even better than the sour kinds. Fairly vigorous terminal growth is necessary for crop production with both sweet and sour cherries. This can be stimulated by nitrate of soda, applied early in the spring at the rate of 3–5 pounds to the mature tree.

Pruning is begun when the two-year tree is set out; all but the leader and two or three well spaced laterals should be removed. The remaining branches should not be headed back. For the mature sweet cherry the spreading type of tree with several large scaffold branches is the most desirable. The main branches may be headed back when they become too high for convenient harvesting. Sour cherries are pruned rather lightly at first, but as soon as growth begins to get short and spurry, the branches must be thinned out and renewal pruning practiced to keep up the vigor of growth.

Harvesting and marketing require special attention. For the cannery, which absorbs a large part of the crop in the fruit districts, cherries are allowed to become dead ripe and then picked without the stems, into 6–8-pound baskets. If they are to be sold fresh on the market they are picked with the stems, taking great care not to bruise the fruit. In the East they are packed either in quart berry baskets and shipped in berry crates or in climax baskets holding 4–12 pounds. In the West sweet cherries are usually marketed in 8–10-pound boxes which are faced. Sometimes sour cherries are held on the trees for a month or more after they are ripe by dusting or spraying to control the cherry maggot. Quantities of sour cherries are pitted and frozen at about 0° F. either with or without sugar, and thus held indefinitely.

Yields are likely to be very variable, due to local conditions. Sour cherries may yield from 15–40 quarts a tree or 3 or 4 tons to the acre. Sweet cherries may yield much more than this under good conditions. Storing cherries for more than a few weeks is not practicable.

Most varieties of sweet cherries need a pollinizer, so at least two varieties should be planted near together. In commercial planting this matter should receive careful attention for some varieties, as for example Napoleon, Lambert and Bing, will not pollinate each other, but may be pollinated by such varieties as Black Tartarian, Black Republican, and Windsor. Sour cherries do not need a pollinizer. The following lists are given in approximate order of ripening, commercial varieties being starred: *Sweet cherries* — Lyons, Ida, Governor Wood, Coe, *Black Tartarian, *Black Republican, *Napoleon, *Lambert, *Bing, *Yellow Spanish, *Schmidt, *Windsor. *Sour cherries* — *Early Richmond, *Montmorency, *English Morello, Chase. *Duke or hybrid cherries* — May Duke, Arch Duke, Olivet, Louis Phillippe, Reine Hortense, Late Duke.

Pests and diseases are in large number. With sweet cherries brown-rot often takes heavy toll by rotting the fruit just as it is ripening. Lime-sulfur 1–50, applied when the fruits are the size of a pea, will help control it. This spray, with ½ pint of nicotine sulfate and 1½ pounds powdered arsenate of lead added and applied just as the petals fall will hold aphis and curculio in check. With sour cherries the fruit-fly or cherry maggot may cause many wormy cherries. Satisfactory control can usually be obtained by spraying the leaves of the lower branches with a mixture of 3 pounds powdered arsenate of lead, 1 pint of molasses and 50 gallons water applied when the fruit-flies appear. In the northern states this is about June 1st to 15th. Farther south it is earlier. Leaf-spot may defoliate the trees late in the season. Control is possible by spraying with lime-sulfur 1–50, immediately after the fruit is picked and, if needed, a month later.

CHERRY, BARBADOS-: *Malpighia glabra.* **Cornelian-**: *Cornus mas.* **Ground-**: *Physalis.* **Indian-**: *Rhamnus caroliniana.* **Jerusalem-**: *Solanum Pseudo-Capsicum* and *Capsicastrum.* **Madden-**: *Maddenia hypoleuca.* **Spanish-**: *Mimusops Elengi.* **Surinam-**: *Eugenia uniflora.* **Winter-**: *Physalis Alkekengi.*

CHERVIL. Two vegetable-garden plants are known as chervil, both native in Europe and members of the Parsley family.

Salad chervil is a hardy annual, *Anthriscus Cerefolium,* of simple culture, the leaves employed in salad and garnishing. It is grown as a spring or autumn crop, not thriving in the heat of summer. Usable leaves are obtained in six or eight weeks after seeds are sown; the autumn sowing is sometimes carried over winter in frames or in mild climates with a protection of mulch. Plants may stand at distances of 8–12 inches; they grow 1½ feet or more tall.

Tuberous chervil is a hardy biennial, *Chærophyllum bulbosum,* producing a carrot-like small gray or blackish edible root. Seed may be sown in August or September (that is, as soon as ripe), but usually it does not germinate till spring and the roots mature in four to six months thereafter; culture otherwise as for carrot. It is the better practice to stratify the seeds in autumn, and they are then regularly sown in spring. If kept in the usual way and allowed to remain dry, they will probably not germinate till the second spring if at all.

CHESTNUT. Attractive trees grown for the edible nuts and to some extent for shade and ornament. The native chestnut *Castanea dentata* (*americana*), European chestnut *C. sativa,* and Japanese chestnut *C. crenata* (*japonica*) are more or less planted; but the chestnut industry is threatened by the bark-disease or blight and in many regions the plantings have been destroyed by it. The Japanese chestnut is reputed more resistant. Chestnut planting for the nuts is now in an arrested or experimental stage in the eastern states on account of the disease; there is yet no remedy except to check its spread by destroying all affected trees; it is hoped that disease-resisting races may be developed. In the Middle West and Pacific region the chestnut is still grown successfully.

The American or native chestnuts, of which there are several improved varieties, are the hardiest and most desirable, and the nuts are the sweetest, but they are also the smallest. The Japanese varieties are often injured by the winter in central New York; the trees are small in stature and precocious; there are several good fruit varieties; the European varieties are somewhat hardier, and some of the varieties thrive in the northern states.

Chestnuts are easily grown when free from blight. They usually bear better when two or more trees are planted near each other. Sprouts in old chestnut clearings are often allowed to remain, and sometimes they are grafted to the improved varieties. The young trees may be grafted in the spring by the whip-graft or cleft-graft method; but the cions should be perfectly dormant, and the operation should be very carefully performed. Even with the best workmanship, a considerable percentage of the grafts is likely to fail or to break off after two or three years. The most popular single variety of chestnut is perhaps the Paragon, which bears large and excellent nuts when the tree is very young; it is accounted a hybrid of European and American species. All chestnuts require well-drained land.

CHESTNUT: *Castanea.* **Cape-**: *Calodendrum capensis.* **Guiana-**: *Pachira aquatica.* **Horse:-** *Æsculus.* **Moreton-Bay-**: *Castanospermum australe.* **Water-**: *Trapa.*

CHICKWEED, MOUSE-EAR: *Cerastium.*

CHICORY (*Cichorium Intybus*). This perennial, native in Europe, is grown for the roots and also as salad. The same plant is also extensively run wild in North America along roadsides and in neglected fields.

The thick roots are employed as substitute for coffee. In this capacity it is a field crop, grown in deep well-prepared soil. Seeds are sown in spring in drills about 18 inches apart, good tillage is provided, and the hard parsnip-like roots are garnered in autumn.

Chicory is grown for the foliage, used as greens or salad. The best-known product is witloof, which is the crown of uncolored leaves forced in winter or spring from stored roots. Seeds of the strain of chicory mostly employed for the production of witloof are sown in drills in spring and thinned to about 6 inches in the row. At the close of the season the roots are lifted, the tops cut off above the crown, and stored in a cellar, the same as other root-crops. For the production of the crown of leaves known as witloof, the roots are trimmed on the lower end to 8 or 9 inches long, then placed upright in soil or sand in a box and the crowns covered with about 8 inches of sand; temperature is kept at about 60°, and in a fortnight the white salad witloof should be ready, a good "head" being 6 inches long.

Sometimes the leaves of chicory are blanched in the field late in the season by banking as for celery; or the same treatment may be applied in spring to the new leaves arising from roots remaining in the ground over winter. Some persons force the stored roots in darkness to obtain the blanched tops. The unblanched leaves are sometimes used as greens.

CHILDSIA: *Hidalgoa Wercklei.*

CHILEAN NUT: *Gevuina Avellana.*

CHILICOTHE: *Echinocystis macrocarpa.*

CHILOPSIS. *Bignoniaceæ.* One deciduous shrub or tree to 20 ft., native Tex., Calif. and Mex. in dry regions, mostly near springs or stream beds, and planted in the S. **C. linearis** (*C. saligna*). DESERT- or FLOWERING-WILLOW. Lvs. linear, to 1 ft. long, entire: fls. trumpet-shaped with 5-lobed crimped limb, lilac with 2 yellow stripes inside, to 2 in. long, in terminal racemes: fr. linear, to 1 ft. long. Var. **alba** has white fls.

CHIMAPHILA. PIPSISSEWA. *Pyrolaceæ* or *Ericaceæ.* Evergreen woods herbs or little subshrubs with creeping sts., toothed lvs. in irregular whorls, white or pinkish fls. in few-fld. terminal long-stalked umbels, and capsular frs.; grown in the wild-garden where it prefers partial shade. Propagated by divisions of the creeping sts.

maculata. To 10 in.: lvs. broadest below the middle, variegated white along the veins. Me. to Ga. and Ala.

umbellata. To 10 in.: lvs. broadest above the middle, not variegated. Eu., Asia. Var. **cisatlantica** is the form native in E. N. Amer.

CHIMONANTHUS FRAGRANS: *Meratia præcox.*

CHINA-BERRY: *Melia Azedarach.*

CHINA-BRIER, FALSE: *Smilax laurifolia.*

CHINA-TREE: *Melia Azedarach.*

CHINESE EVERGREEN: *Aglaonema simplex.*

CHINESE-HAT PLANT: *Holmskioldia sanguinea.*

CHINKAPIN, WATER: *Nelumbium luteum.*

CHINQUAPIN: *Castanea pumila.* Giant: *Castanopsis chrysophylla.*

CHIOCOCCA. SNOWBERRY. *Rubiaceæ.* Shrubs or vines with opposite leathery lvs., small yellow or white fls. in axillary racemes, and fr. a globular white drupe; native Fla. to trop. Amer.

alba (*C. racemosa*). Shrub to 10 ft., or vine: lvs. elliptic or ovate, to 3 in. long: fls. yellow, to ⅓ in. long.

racemosa: *C. alba.*

CHIOGENES. *Ericaceæ.* Two evergreen creeping little plants with small alternate lvs., bell-shaped solitary fls. and fr. a white berry; adapted to the rock-garden, forming mats. A moist peaty soil and partial shade are desirable. Propagated by seeds, division or cuttings.

hispidula. CREEPING SNOWBERRY. Lvs. ovate, to ⅓ in. long: fls. white, ⅙ in. long, May–June. N. Amer.

CHIONANTHUS. FRINGE-TREE. *Oleaceæ.* Two deciduous practically diœcious trees or shrubs with opposite entire lvs., many small white fls. in showy panicles, the 4 petals linear and united only at base, and fr. a dark blue drupe.

The fringe-trees are hardy North with some protection. They succeed in sunny positions in moist sandy loam. Propagated by seeds in autumn or stratified, by layers and cuttings of forced plants, and by grafting or budding on the ash.

retusa. To 20 ft.: lvs. ovate or elliptic, to 4 in. long: panicles to 4 in. long, June–July. China.

virginica. To 30 ft.: lvs. mostly oblong or obovate-oblong, to 8 in. long: panicles to 8 in. long, May–June. Pa. to Fla. and Tex.

CHIONODOXA. GLORY-OF-THE-SNOW. *Liliaceæ.* Early spring-blooming bulbous herbs with narrow basal lvs. and blue or white short-tubed open fls. in loose racemes terminating the scape.

Chionodoxas thrive in any soil but need plenty of moisture and light. Bulbs should be planted approximately 3 inches deep and replanted about the third year. Propagated by offsets or seeds.

gigantea: a large form of *C. Luciliæ.*

grandiflora: a large-fld. form of *C. Luciliæ.*

Luciliæ. To 8 in.: fls. bright blue with white center, 1 in. across. Asia Minor. Var. **alba** has white fls.

sardensis. Perhaps only a form of *C. Luciliæ* with fewer dark blue fls. without white center.

tmolusii: a late-blooming form of *C. Luciliæ.*

CHIONOPHILA. *Scrophulariaceæ.* One per. herb to 6 in. high native in the Rocky Mts. of Colo. and Wyo. and sometimes transferred to the rock-garden. **C. Jamesii.** Lvs. mostly basal, spatulate or lanceolate, entire: fls. cream-colored, ½ in. long, tubular and 2-lipped, in one-sided spikes.

CHIRONIA. *Gentianaceæ.* African herbs with simple opposite lvs. and pink or rarely purple 5-lobed fls. borne in cymes; one species intro. in Calif.

linoides. Sts. to 3 ft.: lvs. linear or lanceolate, to 1½ in. long: fls. about ½ in. long, solitary or 2–5 together. S. Afr.

CHITTAMWOOD: *Bumelia lanuginosa.*

CHIVE: under *Onion.*

CHLORANTHACEÆ. CHLORANTHUS FAMILY. Three genera growing in warm regions, trees or shrubs with opposite lvs., small unisexual fls. without perianth borne in spikes or panicles, having 1 or 3 stamens, 1-celled ovary, and drupaceous fr. The family is allied to Piperaceæ. Ascarina may be planted out-of-doors in the S.

CHLORIS. FINGER-GRASS. *Gramineæ.* Ann. and per. grasses grown for ornament or forage, native in warm regions of the world: spikelets awned, in 2 rows on one side of the rachis, in spikes which are solitary or in terminal umbels. See *Grasses.*

barbata: may be either *C. paraguayensis* or *C. polydactyla*; see also *C. truncata.*

elegans: *C. virgata.*

Gayana. Rhodes-Grass. Per. to 4 ft., stoloniferous: lvs. to 1 ft. long and ⅛ in. wide, flat or folded: spikes to 4 in. long, in umbels of 6–15. Afr., but nat. elsewhere.—Grown in the S. for forage.

paraguayensis. Ann. to 2 ft.: lvs. to 4 in. long, flat or folded: spikes to 2 in. long, purplish, few or several in the umbels. Tropics.

polydactyla. Per. to 4 ft.: lvs. to 2 ft. long and ⅛ in. wide: spikes to 6 in. long, in umbels of 6–25. Trop. Amer.

truncata (*C. barbata vera*). Per. to 1 ft.: lvs. short, to 1/12 in. wide, flat or folded: spikes to 6 in. long, several in one or two whorls. Australia, but nat. in N. Amer.

virgata (*C. elegans*). Per. or ann. to 3 ft.: lvs. to 4 in. long and 1/12 in. wide, flat or folded: spikes to 2½ in. long, pale or purplish, in umbels of 6–15 or more. Tropics.

CHLOROCODON (*Mondia*). *Asclepiadaceæ.* Vines with opposite large lvs., toothed or frilled stipules, and wheel-shaped fls. in axillary panicles; 2 species in Afr., the roots used in medicine and one grown under glass or out-of-doors in the S. Propagated by cuttings over bottom heat.

Whiteii. Mundi-Root. Tall-twining: lvs. ovate, heart-shaped at base, to 7 in. long: fls. purplish, to 1 in. across, having a white 5-lobed crown, Aug. Natal, trop. Afr.

CHLOROGALUM (*Laothoe*). *Liliaceæ.* Tall bulbous herbs with mostly basal tufted lvs. and white or purplish fls. in panicles, the perianth-segms. distinct; native in Calif. Cult. as for *Camassia.*

pomeridianum. Soap-Plant. Amole. To 5 ft.: lvs. to 1½ ft. long and ¾ in. wide, wavy-margined: fls. white veined purple, ¾ in. long, opening in afternoon.

CHLOROPHORA. *Moraceæ.* Milky-juiced trees from trop. Amer. and trop. Afr., with alternate lvs., staminate fls. in dense catkin-like spikes, pistillate in dense heads, and fr. an achene; grown in trop. countries for the yellow dye and the valuable yellow wood.

tinctoria. Fustic. To 60 ft., with spreading broad head: lvs. lanceolate to elliptic, to 5 in. long, entire or toothed. W. Indies, S. Amer.

CHLOROPHYTUM. *Liliaceæ.* Trop. herbs closely related to Anthericum and differing chiefly in the somewhat broader lvs. and sharply 3-angled caps.; fls. in long open erect racemes or spikes. Grown in greenhouses and out-of-doors in warm regions; they are more or less proliferous, and are easily multiplied.

comosum (*Anthericum comosum. C. Sternbergianum*). To 3 ft.: lvs. 2 ft. long: fls. white. Cent. Afr.

elatum (*Anthericum elatum*). To 3 ft.: lvs. 1 ft. long: fls. whitish, ¾ in. across. S. Afr.—Known mostly in the striped-leaved forms, as *Anthericum Mandaianum, variegatum* and *vittatum*, margined and ribbed with white, and *A. picturatum* with yellow band down center.

Sternbergianum: *C. comosum.*

CHOISYA. *Rutaceæ.* Mexican evergreen shrubs with digitately compound lvs., showy white fls. in axillary cymes, and fr. of 3 or 5 carpels.

One species is grown under glass, and out-of-doors in the South and California where it stands a few degrees of frost. Propagated by cuttings of young wood over heat or of older wood in a coldframe.

ternata. Mexican-Orange. To 10 ft.: lvs. of 3 oblong to ovate lfts. to 3 in. long: fls. fragrant, 1 in. or more across, conspicuous over the foliage.

CHOKEBERRY: *Aronia.*

CHOKE-CHERRY: *Prunus virginiana.*

CHOLLA: *Opuntia.*

CHONDROSEA: *Saxifraga Aizoon.*

CHORISIA. *Bombacaceæ.* S. American spiny trees with alternate digitately compound lvs., large fls. and pear-shaped capsular frs., the silky floss on the seeds used for stuffing pillows. Sometimes planted in S. U. S.

speciosa. Floss-Silk Tree. Lfts. lanceolate, toothed: fls. yellowish striped with brown at base, 3 in. across, solitary in axils. Brazil.

CHORIZEMA. *Leguminosæ.* Shrubs or subshrubs with simple alternate lvs., papilionaceous showy fls. in racemes, and short pods; native to Australia.

They may be planted out-of-doors in the South or grown in greenhouses; they require plenty of sun. Propagated by cuttings in spring under glass.

cordatum. Shrub to 10 ft. with weak branches: lvs. with small prickly teeth, ovate-lanceolate: fls. orange-red, or scarlet with purplish keel, in long loose or open racemes, abundantly produced.

ilicifolium: the plant known to the trade under this name is *C. cordatum.*

varium. Shrub to 6 ft.: lvs. cordate-ovate, with prickly teeth: fls. with light orange standard and purple-red wings and keel, borne in short close racemes.—Apparently not in general cult. with us.

CHOROGI: *Stachys Sieboldii.*

CHRISTMAS-BERRY: *Heteromeles arbutifolia.* -Tree: *Schinus terebinthifolius.*

CHRISTMAS-ROSE: *Helleborus niger.*

CHRISTOPHINE: *Chayote, Sechium.*

CHROSPERMA: *Amianthium muscætoxicum.*

CHRYSALIDOCARPUS. *Palmaceæ.* About 10 diœcious gregarious unarmed feather-palms of small stature in Madagascar, one of them popular in cult.: sts. slender, ringed: lvs. plume-like, gracefully arching; pinnæ very many, bifid, narrow: spadix among the lvs., branching; stamens 6, pistillode more or less 3-lobed: fr. ovoid or ellipsoid, about 1 in. or less long. See *Palm.*

lutescens (*Areca lutescens*). Sts. many, forming an attractive clump to 25 or 30 ft., foliaged nearly or quite to the base: pinnæ 40–60 pairs, mostly less than 1 in. broad, midrib strong, the ends not much arching or drooping; petiole 2 ft. long, yellow, convex below and deeply furrowed above, suddenly much expanded at base: fr. oblong-ellipsoid, about ¾ in. long, violet-black.—Much grown as a florists' plant for pots and tubs, and attractive in the open in S. Fla. and tropics.

madagascariensis (*Dypsis madagascariensis*). Clumps with a denser head than *C. lutescens* and less likely to be foliaged to base, the lvs. more numerous and the pinnæ about twice as many with the tips arching or hanging: fr. ovoid-elliptic, about ½ in. long.

CHRYSAMPHORA: *Darlingtonia.*

CHRYSANTHEMUM. *Compositæ.* A large genus of ann. and per. herbs, some of them woody at the base, a number of which are grown for the showy bloom; native in temp. and boreal regions, mostly in the Old World. Matricaria and Tanacetum are closely allied.

The cultivated chrysanthemums are hardy and half hardy mostly strong-scented and rather coarse plants, with colors in various series except blue and true purple; they usually bloom late in the season in the open. A half dozen cultural classes may be distinguished: 1. The flower-garden annuals; 2. feverfews; 3. pyrethrums; 4. marguerites; 5. perennial border kinds, yielding some of the flowers known as daisies; 6. the florists' chrysanthemum. In these various ranges are excellent decorative materials and possibilities. The interest in these plants is represented by the Chrysanthemum Society of America.

1. The annual chrysanthemums are big flower-garden subjects, suitable for late summer and autumn mass colors, raised readily from seeds which commonly are sown as soon as the ground is fit directly where the plants are to stand; they may be grown thickly in back rows, but for best blooms should be thinned to 12–24 inches apart; provide an open sunny position. Three species are involved. *C. coronarium* is the tallest, and single large plants sometimes need staking. *C. carinatum* is the usual flower-garden kind, in many colors. *C. segetum* yields good clear yellows.

2. Feverfews are forms of *C. Parthenium*, sometimes known as a pyrethrum. All are perennial, hardy, of the simplest culture, and persistent. They are grown for the abundant little white-rayed heads with yellow center, and dwarf compact forms for the foliage which is sometimes crisped and yellow-tinged; the latter kinds are known as Golden-Feather. They grow readily from seeds, blooming the second year, and frequently they seed themselves; offsets may be taken from the clumps.

3. Pyrethrums, product of *C. coccineum*, useful for cutting and employed as a florist's flower. The stems are long and simple from a crown of attractive foliage; the daisy-like heads are bright white, rose, carmine, lilac and other shades; bloom in late spring and summer; an autumn cutting may be had if the flowers are all cut regularly. Propagated by seeds, blooming the second year; named horticultural varieties by offsets or division.

4. Marguerite chrysanthemums belong to *C. frutescens*, although the related *C. anethifolium* is sometimes seen; it is sometimes known as Paris daisy. It is tender in the North, and is grown in pots and tubs for late winter, spring and summer bloom. Propagated by cuttings, like the florist's chrysanthemum; taken in spring they should give blooming plants for the following winter and spring. Shift into larger pots as needed. Old plants may be cut down and bloom renewed for another year if grown in tubs or big pots.

5. The perennial border chrysanthemums are hardy strong plants propagated by division, and by seeds which give blooming plants the second year; if necessary, they may be multiplied by short cuttings of young firm shoots. They require sunny positions.

6. The common chrysanthemum of florists (*C. morifolium*) is known in two races or types: the kinds developed into very large flowers for pot culture, and the border bushy kinds that remain always in the perennial garden. These two types are not essentially different, however, as the large flowers of the florists' kinds are developed not alone by selection but by extra care in propagation, culture, pruning and disbudding; they express the skill of the grower; if left to themselves to produce bushy plants, the florists kinds bear many small or medium-sized flowers. All these plants are essentially hardy perennials, propagated by seeds, cuttings and division.

The usual propagation of the house chrysanthemum is by cuttings taken in spring from shoots that arise from crowns of plants that have been carried through the winter; when the plants begin to stool or to send up new growth, the shoots are cut 2 or 3 inches long and inserted in sand in boxes or on a bench; the cuttings are trimmed of their lower leaves and the remaining (upper) leaves are usually cut in two to reduce evaporating surface; as soon as rooted they are placed in small pots, say 2½-inch.

The young plants may be carried through the summer in pots, after repotting two or three times, or planted in the ground and lifted in October or November. Every pains should be taken to keep the plants growing without check or insect or fungus injury. If one does not care to propagate them, plants may be purchased in late spring or early summer, that have been potted and are well rooted and stocky. By the time the plants are to bloom they should be in 6-inch pots or larger; if very large bushy plants are desired, the pots should be 10- or 12-inch.

For cut-flowers, the plants are usually grown by florists in benches under glass from first till last, after the cuttings are turned out of their first small pots; if to be grown to single stems for very large bloom, the plants may be set 8–12 inches apart each way on the benches, and they are tied, trained and disbudded as they grow, only the terminal bud being retained.

The amateur usually prefers to allow bushy plants with a good number of smaller flowers. The plants are allowed to branch. All weak growths should be removed as they appear, and when buds begin to show they should all be removed except the terminal one on the branch; in this way there will be as many flowers as branches, say one to two dozen depending on the size and vigor of the plant and the wish of the grower. The heads or flowers will be of approximately one size. The plants may be bloomed in pots 6 inches or larger or in soap boxes for the window. The plants are discarded after blooming unless one wants to propagate a new lot for the following year, and in this case the tops are cut down and the pot or box placed in a cellar and kept dry enough to maintain life and strength but not to start into growth or induce decay; in February or March the plant may be brought to warmth and light, given water, and shoots for cuttings will soon start. It is to be remembered that the plant is a hardy perennial and that it should be grown cool when in the house.

The types or groups of *C. morifolium* are many, and there are named varieties under each group. This range allows of a choice to satisfy any taste.

achilleæfolium. Yarrow C. Per. border species, 2 ft., little branched, rooting at bottom: lvs. soft-hairy: fls. yellow. Siberia, Caucasus.

anethifolium. Glaucous Marguerite or Dill C. Per. with fine glaucous foliage: fls. white, sometimes lemon-yellow. Canaries.—Greenhouse plant in the N. much like marguerite but less coarse.

alpinum (*Leucanthemum alpinum*). Per., 2–6 in. high, with 1 terminal head on each st.: lvs. to 2 in. long at base of st., cut into narrow segms., those on st. few and very small: fl.-heads white. High Alps.—Rock-garden.

arcticum. Arctic C. Per. to 15 in., more or less decumbent at base: fls. aster-like, to 2 in. across, white to lilac. Arctic regions.—Border plant.

asiaticum: listed name.

atratum (*C. coronopifolium*). Per. 6–12 in., mostly 1-headed: lower lvs. 1-divided, the segms. 5–7-toothed, those on st. lanceolate or linear: rays white. Alps.

atrococcineum: *C. carinatum.*

Balsamita (*Tanacetum Balsamita*). Costmary. Per. 2–3 ft.: lvs. serrate: heads many, ¼–⅜ in. across, with very short white rays; commonly rayless and then known as var. **tanacetoides.** W. Asia.—Persistent plant sometimes grown for its sweet-smelling herbage, and erroneously called "lavender"; also known as "mint-geranium."

bicolor: *C. carinatum.*

Broussonetii (*Ismelia Broussonetii*). Per. 2–3 ft.: lvs. ovate or obovate, pinnatifid, the narrow segms. pinnatifid or toothed: heads long-peduncled, to 3 in. across, rays lilac, yellowish at base. Canaries.

Burridgeanum: *C. carinatum.*

carinatum. Tricolor C. Glabrous ann., 2–3 ft., nearly simple or somewhat forking: lvs. pinnatifid into linear lobes: heads large, 2½ in. or less, rays white, red, purple, yellow, disk purple, colored ring at base of rays. Morocco.—Flower-garden; cult. also as *C. atrococcineum, C. bicolor, C, Burridgeanum, C. Dunettii, C. tricolor.*

caucasicum (*Pyrethrum caucasicum*). Per., st. erect from the rhizome, 1-headed: lvs. parted into linear-awl-like lobes: head long-peduncled, 1½ in. across, rays white. Caucasus.

cinerariæfolium. Dalmatian C. or Pyrethrum. Per., 12–24 in., producing many slender sts., herbage silvery: heads white, 1 in. or more across, on very long sts. Dalmatia.—A source of insect powder.

coccineum (*Pyrethrum roseum. P. carneum. P. atrosanguineum*). Pyrethrum. Per., nearly or quite simple, 1–2 ft.: lvs. bipinnatifid, fern-like: heads large and showy, terminating the sts., red in various shades, pink, lilac, white, sometimes double. Caucasus, Persia.—Used by florists.

coreanum: hort. name for a form with single white fls.

coronarium. Garland C. Crown Daisy. Stout branchy ann., 3–4 ft., with lvs. divided nearly to the midrib, the segms. less than ¼ in. broad and again cut or toothed: heads many, 1–1½ in. across, yellow or whitish, often double; achenes with prominent straight parallel ridges on back. Medit. region.—Flower-garden; young shoots eaten in Japan. Var. **spatiosum.** To 2 ft. or more, stout and very leafy, glaucous: lvs. broad-spatulate, mostly 1 in. or more across, lobed or cut half way or less to midrib or with deeper lobes on narrow lower part: fls. light yellow: grooves on achenes not prominently parallel or deep. China.—Grown for the young shoots which are eaten, and not unknown in this country; known as "boong-hau-ts'ai," "shungiku" and "chop suey greens."

coronopifolium: *C. atratum*; sometimes *C. coccineum* is meant.

corymbosum (*Pyrethrum corymbosum*). Per., 2–4 ft.: lvs. bipinnatifid: heads many on terminal branches, 1 in. or less across, white. Caucasus.—Border.

Dunettii: *C. carinatum.*

Fontanesii (*Hymenostemma Fontanesii*). Ann., slender, much branched, 12–18 in.: lvs. spatulate, toothed or almost lobed: heads small, about ½ in. across, rays white. W. Medit. region.—Flower-garden.

frutescens. Marguerite. Paris Daisy. Per., to 3 ft., much branched, becoming woody: lvs. not glaucous, coarsely divided, rather fleshy: heads many, on straight sts., 1½–2½ in. across, white or lemon-yellow. Canaries.—Florist's subject.

hortorum: *C. morifolium.*

indicum. Per., 2–3 ft., much branched, soft-foliaged: lvs. divided, felty gray beneath: heads numerous, short-stemmed in clusters, ½–1 in. across, yellow, showy only in mass. China.—Border; very little known in cult.

inodorum: *Matricaria inodora.*

lacustre. Portuguese C. or Daisy. Tall per., 3–6 ft., branched at top: lvs. narrow, serrate-dentate: heads long-stemmed, 2–3 in. across, white. Portugal.—Border.

Leucanthemum (*Leucanthemum vulgare. L. grandiflorum*). Whiteweed. Ox-eye Daisy. Per., slender, 1–2 ft., simple or little branched: lvs. simple, notched or cut: heads terminal and long-stemmed, 1–2 in. across, white. Eurasia, and an abundant weed in E. U. S.—Sometimes planted in borders.

macrophyllum (*Tanacetum macrophyllum*). Tansy C. Per., 2½ to 3½ ft., erect, branching: lvs. coarsely pinnatisect: heads numerous in terminal corymbs, ¼ in. or less across, with small white or yellowish rays. S. E. Eu. to Caucasus.—Border.

maximum. Max C. or Daisy. Short-lived per., often treated as bien., erect, simple or only sparingly branched, 1–2 ft.: lvs. long and narrow, serrate-dentate: heads terminal and large, 2–4 in. across, with many white rays. Pyrenees.—Border plant, known in many forms, as King Edward VII, Chrysanthemum Daisy, Shasta Daisy, Glory of the Wayside, *C. Robinsoni* and erroneously as *C. Leucanthemum.*

morifolium (*C. sinense. C. hortorum*). Florists C. Per., 2–4 ft., branched: lvs. broad, lobed, gray-pubescent, strong-scented: heads many terminating branches, of various sizes and greatly modified in shape, fashion and color. Cultigen, probably of Chinese origin.—Under glass, and some of the kinds in the permanent border.

Myconis. Ann., 18–30 in., branched above: lower lvs. spatulate-obtuse, small-toothed, upper narrow-oblong to linear: heads long-peduncled, rays yellow, broad. S. Eu.—Plants cult. under this name may be *C. segetum.*

nipponicum. Nippon C. or Daisy. Per., shrubby at base, 1½–2 ft., leafy above, sts. simple or little branched: lvs. thick, spatulate and obtuse, serrate at end: heads terminating sts., 1½–3½ in. across, white. Japan.—Border.

pallens. Per., st. erect, hispid, simple or nearly so, 10–16 in.: lower lvs. obovate, obtuse, crenate, petiolate, upper ones ligulate and somewhat clasping and become entire toward top of st.: heads solitary, rays white. Mts., France.

Parthenium (*Pyrethrum Parthenium* and *P. partheniifolium. Matricaria parthenoides, M. capensis*, and *M. eximia*). Feverfew. Bushy per., 1–2 or 3 ft., very leafy: lvs. variable, pinnatisect, often yellowish (var. **aureum**), sometimes crisped (var. **crispum**): heads many in open terminal clusters, ¾ in. and less across, white-rayed, sometimes rays absent. Eurasia.—Border; there are dwarf very compact forms.

Robinsoni: *C. maximum.*

rotundifolium. Per., st. glabrous, simple, erect, to 18 in.: lower lvs. ovate to broad-cordate, petiolate, mucronate-dentate, upper ones becoming narrower: head solitary, 1 in. and more across, white. Hungary.

segetum. Corn-Marigold. Ann., 1–2 ft., much branched: lvs. notched or shallowly pinnatifid: heads terminating branches, to 2½ in. across, yellow to whitish. Old World.—Flower-garden cult. forms with more divided lvs. are supposed to belong here, as Morning Star, Evening Star, Gold Star, Northern Star, White Glory, although different things may be grown under one or another of these varietal names.

serotinum: uncertain name in lists.

sinense: *C. morifolium.*

Tchihatchewii: *Matricaria Tchihatchewii.*

tricolor: *C. carinatum.*

uliginosum. High or Giant Daisy. Tall and much-branched per., 4–7 ft.: lvs. narrow, long-pointed and cut-toothed: heads terminating branches, 1½–3 in. across, white. Eu.—Border.

viscosum. Ann., somewhat viscid, st. fleshy, mostly branched above: lower lvs. oblong, narrowed at base, pinnatifid with short obtuse denticulate lobes, upper ones oblong-lanceolate and clasping: rays long-oblong, yellow. S. Spain, N. Afr.

vulgare: *Tanacetum vulgare.*

CHRYSOBACTRON: *Bulbinella Hookeri.*

CHRYSOBALANUS. *Rosaceæ.* Shrubs or small trees with alternate simple leathery lvs., small white or greenish fls. in cymes or panicles, and fr. a pulpy drupe; native in Amer. and Afr. and planted somewhat in S. U. S.

Icaco. Coco-Plum. To 30 ft., evergreen: lvs. broad-obovate or nearly orbicular, to 3 in. long, obtuse or emarginate, shining above: fls. white, in short cymes: fr. to 1½ in. long. S. Fla. to N. S. Amer.

CHRYSOBOTRYA: *Ribes aureum* and *odoratum.*

CHRYSOGONUM. *Compositæ.* One per. herb native from S. Pa. to Fla. and Ala. and sometimes transferred to gardens. **C. virginianum.** Golden-Star. To 1 ft., hairy: lvs. basal and opposite, ovate or oblong, to 3 in. long, toothed: heads yellow, to 1½ in. across, long-stalked, of ray- and disk-fls., Apr.–July; pappus a short crown.

CHRYSOPHYLLUM. *Sapotaceæ.* Trop. evergreen trees, one in S. Fla., with alternate entire lvs., small 5-lobed fls. in clusters, and fr. a berry; one species grown for ornament and the edible fr.

The star-apple requires tropical temperatures and a humid atmosphere. It has been grown successfully in southern Florida. It is not particular as to soil. Propagated by seed, by cuttings of ripe wood over heat, and probably by budding.

Cainito. Star-Apple. To 50 ft.: lvs. oval or oblong, to 6 in. long, shining above, golden-brown and silky beneath: fls. purplish-white: fr. globular, to 4 in. across, smooth, purple or light green, with 3–8 shining seeds embedded in white translucent pulp. Trop. Amer.

CHRYSOPSIS. Golden Aster. *Compositæ.* N. American per. herbs with alternate entire sessile lvs. and yellow heads of ray- and disk-fls.; pappus of bristles or scales. Sometimes transferred to the border. Propagated by seeds and division.

falcata. To 1 ft., woolly-pubescent: lvs. linear, to 4 in. long, stiff: heads ½ in. across, in corymbs. Mass. to N. J.

graminifolia. To 3 ft., silvery-pubescent: lvs. linear, grass-like, to 1 ft. long: heads ½ in. across, in few-fld. corymbs. Del. to Fla. and Mex.

mariana. To 2½ ft., pubescent: lvs. oblong or spatulate, to 4 in. long: heads to 1 in. across, numerous, in panicled corymbs. S. N. Y. to Fla. and La.

villosa. To 2 ft., pubescent: lvs. oblong to lanceolate, to 2 in. long: heads 1 in. or more across, in few-fld. corymbs. Minn. to B. C. and New Mex.

CHRYSOSPLENIUM. GOLDEN SAXIFRAGE. *Saxifragaceæ.* Semi-aquatic little creeping or prostrate paludose herbs with very small greenish fls., sometimes employed as a cover on moist ground or in bog-gardens.

alternifolium. To 6 in.: lvs. alternate, orbicular-reniform, coarsely toothed: fls. in early spring. Eu., N. Asia.

americanum. Sts. creeping, to 8 in. long: lvs. opposite or the upper alternate, ovate or orbicular, to ¾ in. long: fls. solitary in the axils, in spring. N. S. to Minn. and Ga.

oppositifolium. To 4 in.: lvs. opposite, orbicular: fls. May–June. Eu., N. Asia.

CHRYSOTHAMNUS. *Compositæ.* Low shrubs of W. N. Amer. with linear entire mostly alternate lvs. and heads of yellow disk-fls.; pappus of bristles. Sometimes transferred to grounds in dry regions.

nauseosus. To 3½ ft., white-tomentose: lvs. to 2½ in. long: heads in cymes. B. C. to Mont. and Calif.

CHRYSURUS: *Lamarckia.*

CHUCHU: see *Chayote.*

CHUFA: *Cyperus esculentus.*

CHUSQUEA. *Gramineæ.* Bamboo-like shrubby or climbing grasses with rather small lvs. and spikelets borne in terminal panicles, stamens 3; native in the Andean region from Mex. to Chile. See *Bamboo.*

tessellata. Shrub: lvs. to 3 in. long and ¼ in. wide, toothed, tessellated: panicle spike-like, to 6 in. long. Colombia.

CHYSIS. *Orchidaceæ.* Cent. American epiphytes with pseudobulbs or spindle-shaped sts. and fleshy fls. in racemes, the petals and dorsal sepal similar, the side sepals forming an extension with the foot of the column, the lip of 3 lobes; grown in the trop. greenhouse. See *Orchids.*

aurea. Lvs. elliptic-lanceolate, to 6 in. long: fls. about 2 in. across, in 8–13-fld. racemes to 6 in. long; sepals and petals golden-yellow, whitish near base; lip yellow marked with red, keeled at base, the limb wavy, May–June. Venezuela, Mex.

bractescens. Fls. to 3 in. across, in 3–5-fld. partially drooping racemes, ivory-white with yellow lip marked with red, Apr.–May. Mex.

Chelsoni. Hybrid between *C. lævis* and *C. Limminghei*: sepals and petals yellow with a large red-brown spot; lip white finely spotted with purple.

CIBOTIUM. *Cyatheaceæ.* A small group of stout tree-ferns, often grown under glass in juvenile form, with mostly 3-pinnate lvs., sori at tips of veinlets; native in Cent. Amer., Mex. and Polynesia. See *Ferns.*

Barometz. SCYTHIAN LAMB. Trunkless: lvs. fragrant, segms. linear-oblong, to 6 in. long, glaucous beneath. China, Malaya.—Sometimes grown for its historic interest.

princeps: probably a mistake for *Cyathea princeps* which is a synonym of *C. insignis.*

regale. Trunk to 30 ft. high: lvs. to 12 ft. long, with falcate deeply cut segms., glaucous beneath. Mex.

Schiedei. Trunk to 15 ft.: lvs. to 5 ft. long, gracefully drooping, segms. to 8 in. long, deeply cut, glaucous beneath, on stout brown-hairy stipes. Mex., Guatemala.

CICCA DISTICHA: *Phyllanthus acidus.*

CICER. *Leguminosæ.* Herbs with pinnate toothed lvs., small inconspicuous papilionaceous fls., and short inflated pods; native in W. Asia, one species grown for the edible seeds which may be planted 8–12 in. apart in drills 2 ft. apart.

arietinum. CHICK-PEA. GARBANZO. Ann. to 2 ft.: fls. white or reddish, solitary in the axils: pods to 1 in. long and ½ in. wide, containing 1 or 2 seeds.—Long cult. in S. Eu. and Asia for human food.

CICHORIUM. *Compositæ.* Herbs of the Old World, mostly with deep hard roots, alternate lvs. usually near base of plant, and blue, purple or white heads of ligulate or ray-fls. See *Chicory* and *Endive.*

Endivia. ENDIVE. Ann. or bien. to 3 ft.: lvs. many at base, brittle, oblong, lobed or much cut and curled: heads purple, subtended by leafy bracts usually longer than heads. Probably India.

Intybus. CHICORY. SUCCORY. Per. to 6 ft.: lvs. broad-oblong or lanceolate: heads bright azure-blue, 1½ in. across, opening in forenoon, in some races pink or white, subtended by bracts shorter than heads. Eu.; extensively nat. in N. Amer.

CICUTA. WATER-HEMLOCK. *Umbelliferæ.* Per. heavy-scented herbs with poisonous roots and decompound lvs., very small white fls. in terminal compound umbels, and slightly flattened frs.; sometimes transplanted to the wild- or bog-garden.

maculata. MUSQUASH-ROOT. To 6 ft.: lvs. 2- or 3-pinnate into lanceolate segms. to 5 in. long. N. B. to Fla. and New Mex., in swamps.

CIGAR-FLOWER: *Cuphea platycentra.*

CILIATE: bearing hairs on the margin; fringed with hairs.

CIMICIFUGA. BUGBANE. *Ranunculaceæ.* Tall herbaceous perennials, mostly of rich woods, sometimes planted in the back of the border or in partially shaded places in the wild-garden: lvs. 2-compound, rather large: fls. small, white, in racemes: native in north temp. zone. Closely allied to Actæa but fr. a follicle instead of a berry.

Bugbanes thrive best in rich soil. Propagated by seed or division of roots in early spring or fall.

acerina: *C. japonica.*

americana. To 5 ft.: lfts. ovate to oblong, to 3 in. long: fl.-pedicels with minute bracts; pistils 3–8, stalked; Aug.–Sept. N. Y. to Ga.

cordifolia (*C. racemosa* var. *cordifolia*). To 6 ft.: lvs. broad-ovate, to 7 in. wide, cordate at base: fl.-pedicels bracted; pistil 1, sessile; Aug. Va. to N. C. and Tenn.

davurica. To 4 ft.: lvs. cordate: fls. creamy-white, pedicels bracted; pistils 5; autumn. Asia.

fœtida. To 6 ft.: lfts. ovate or lanceolate, to 3 in. long: fl.-pedicels with minute bracts; pistils 4–8; summer. E. Eu., Siberia.

japonica (*C. acerina. Pityrosperma acerinum*). To 3 ft. but true st. almost none, the scapes and lvs. arising from near the ground: lvs. ternate, lfts. thin, to 6 in. long and nearly or quite as broad, lobed and dentate, with the look of foliage of *Anemone japonica*: fls. sessile, without bracts, in slender spikes, dull-colored; stamens about 6. Japan.—Variable, in several forms.

racemosa. Black Cohosh. Black Snakeroot. To 8 ft.: lfts. ovate or oblong: fl.-pedicels bracted; pistils 1–2, sessile; July–Aug. Me. to Ga. and Mo.

simplex (*C. racemosa* var. *simplex*). To 3 ft.: fls. in slender dense racemes, pedicels with minute bract or none; pistils 2–3, stalked; in autumn. Kamtschatka.

CINCHONA. *Rubiaceæ.* Trees and shrubs native in the Andes, the bark yielding quinine for which they are cult. in trop. regions and known as Peruvian bark trees: lvs. opposite: fls. small, rose or yellowish-white, tubular, 5-lobed, in terminal panicles: fr. a caps. with winged seeds.

A few species are grown for ornament and economic interest in southern California, and sometimes under glass. Propagated by seeds.

Calisaya. Tall tree: lvs. oblong to obovate, to 7 in. long, shining, purplish-green below: fls. rose or whitish: caps. ovate, scarcely as long as fls. Bolivia, Peru.

officinalis. Tall tree: lvs. oblong, to 5 in. long: fls. rose, ½ in. long, in panicles to 6 in. long: caps. oblong, ½ in. long. Peru, Bolivia. Var. **condaminea** has ovate caps.

succirubra. Tall tree: lvs. ovate or oval, to 9 in. long, pale beneath: fls. rose with purplish-red calyx: caps. lanceolate. Ecuador.

CINERARIA of florists is a Senecio, supposed to be the issue of *S. cruentus* either directly or in hybridization with other species. It is much grown under glass for the profuse bloom in many colors except yellows, well set off by the heavy attractive foliage. The plant is perennial but it is commonly grown as an annual inasmuch as the bloom from strong well-grown new stock is most profuse. The single-flowered kinds are mostly preferred, being raised each year from seeds. For bloom in autumn and early winter seeds may be sown in May: for winter and spring bloom in late summer or early autumn. The main lot is usually started in midsummer. The young plants are pricked off into pots and afterwards shifted to maintain a continuous growth, and not allowed to bloom until in their final 5-or 6-inch pots or 8-inch for very large specimens. The double-flowered kinds are propagated by cuttings of strong shoots that arise after the flowering tops are removed. Cinerarias must be grown cool or they will not give good results, as cool as carnations. If broad bushy plants are desired, the center may be pinched out when the flower-buds begin to show. The cineraria is subject to greenfly or aphis; if fumigation cannot be practiced, the pots may be stood on tobacco stems or tobacco preparations may be employed. Cineraria is adapted to window-garden culture if not grown too hot or neglected and stunted.

Other plants known as cinerarias are some of the dusty millers: see *Senecio Cineraria* and *S. leucostachys.*

CINEREOUS: ash-colored; light gray.

CINNAMOMUM. *Lauraceæ.* Evergreen aromatic trees and shrubs from Asia and Australia, with coriaceous lvs. strongly 3-nerved from base except in *C. Camphora,* small bisexual or unisexual fls. in panicles, and fr. a berry; grown somewhat far S. for ornament and for medicines and spice, and likely to be seen as specimens in collections of economic plants.

A sandy loam soil is good for them. Propagated by seeds and the seedlings early transplanted into pots preparatory to permanent planting out; also cuttings of half-ripened wood in spring with heat.

Burmanni. Tree: lvs. opposite or sometimes alternate, ovate-oblong, acuminate. Malaya.

Camphora (*Camphora officinarum. Laurus Camphora*). Camphor-Tree. Tree to 40 ft., the buds inclosed by large imbricated scales: lvs. alternate, ovate-elliptic, acuminate, to 5 in. long, whitish beneath: fls. yellow, in panicles shorter than lvs. China, Japan.—Wood furnishes commercial camphor; thrives in S. Calif. and in southernmost states, as a street tree.

Cassia. Cassia-Bark-Tree. Tree to 40 ft.: lvs. opposite, oblong to lanceolate, long-acuminate, to 6 in. long: fls. in panicles as long as lvs. China.—Bark used as substitute for cinnamon.

glanduliferum (*Laurus glandulifera*). Tree: lvs. alternate, elliptic or lanceolate, to 5 in. long, caudate-acuminate: fls. in panicles 2 in. long. Himalayas.

Loureirii. Cassia-Flower-Tree. Medium-sized tree: lvs. alternate or opposite, elliptic to oblong, to 5 in. long. China, Japan.

pedunculatum. Tree: lvs. alternate, oblong-lanceolate, acuminate, to 5 in. long: fls. in corymbs about length of lvs. Japan.

zeylanicum. Cinnamon-Tree. Tree to 30 ft.: lvs. ovate to ovate-lanceolate, obtuse or acute, to 7 in. long: fls. yellowish-white, in panicles as long as lvs. India, Malaya.—Bark yields commercial cinnamon.

CINNAMON-TREE: *Cinnamomum zeylanicum.* **-Vine:** *Dioscorea Batatas.* **Wild:** *Canella Winterana.*

CINQUEFOIL: *Potentilla.*

CIPURA. *Iridaceæ.* Trop. American bulbous herbs with white or blue fls. having short tube and 3 inner petals much shorter than 3 outer; grown under glass or out-of-doors in S. Propagated by offsets and seeds.

martinicensis: *Trimeza martinicensis.*

paludosa. Lvs. linear, to 1 ft. long: fls. in clusters, white, ¾ in. long, opening in morning and soon withering. Trinidad, S. Amer.

CIRCÆA. *Onagraceæ.* A few species of small soft erect per. herbs, mostly in woods of the northern hemisphere, not regular hort. plants but sometimes raised in shaded or moist rock-gardens: lvs. opposite, ovate, dentate or angled: fls. whitish, very small, 2-petalled, in terminal raceme: fr. bristly.

lutetiana. Enchanters-Nightshade. Soft closely pubescent herb to 2 ft. or more, branched, with thick stolons: lvs. broad-ovate: petals broad-obovate, longer than broad. Eu.—An American plant that has mostly passed under this name is *C. latifolia,* with sts. glabrous below the infl., stolons very slender, lvs. oblong-ovate, petals sometimes as broad as long. N. B. to Tenn. and Okla., and E. Asia.

CIRCASSIAN SEEDS: *Adenanthera pavonina.*

CIRRHOPETALUM: *Bulbophyllum.*

CIRSIUM. Plumed Thistle. *Compositæ.* Prickly coarse herbs with basal or alternate very spiny lvs. and purple, yellow or white heads of disk-fls., the bracts of involucre densely imbricated and often spiny-tipped; pappus plumose, this differing from Carduus. A few species are grown for ornament, being adapted to bold effects.

acaule: *Carlina acaulis.*

ciliatum. Bien. to 3 ft.: lvs. pinnate into linear-lanceolate segms., hairy above, gray-tomentose below: heads purple. S. Russia.

Diacantha (*Chamæpeuce Diacantha*). FISHBONE THISTLE. Bien. to 3 ft.: lvs. linear-lanceolate, slightly toothed, glabrous above, white-tomentose beneath: heads purplish. Asia Minor.

discolor. Bien. or per. to 7 ft.: lvs. pinnately cut into linear toothed segms. white-tomentose beneath: heads pale purple or pink, to 2 in. across. N. B. to Ga. and Mo.

Hillii. Per. to 2 ft.: lvs. oblong, lobed or pinnatifid into broad obtuse toothed segms., green both sides: heads purple, to 3 in. across. Ont. to Pa. and Ia.

lanceolatum. Bien. to 5 ft.: lvs. pinnatifid into lanceolate toothed segms., hairy above, brown-tomentose beneath: heads dark purple, to 2 in. across. Eu., Asia; nat. in N. Amer.

occidentale. Bien. to 3 ft., the herbage mostly white-floccose: lvs. lanceolate to oblong, to 10 in. long, dentate or pinnatifid, more or less prickly: heads to 2 in. high, reddish or purple. S. Ore., Calif. Var. **candidissimum** is very stout and prominently white-tomentose. Var. **Coulteri** has long branches bearing single heads. Var. **venustum** has heads webby rather than woolly or tomentose.

syriacum (*Notobasis syriaca*). Ann. to 3 ft. or more: lvs. oblong, lobed, spiny-toothed, the upper pinnate into narrow segms., pubescent beneath: heads lilac, to 1 in. long. Medit. region.

CISSUS. *Vitaceæ.* Mostly tendril-climbing shrubs often with fleshy sts., lvs. simple or compound, deciduous or persistent, fls. with parts in 4's, bisexual or unisexual, in cymes; fr. a berry. Grown under glass, and out-of-doors in warm regions. Propagated by cuttings, and by seeds when obtainable.

acida (*Vitis acida*). Low somewhat succulent climber: lvs. stiff, of 3 lfts.: fls. in compound umbel-like clusters: fr. enlarged above middle. S. Fla., Ariz., and south.

antarctica (*Vitis antarctica*). Lvs. ovate to oblong, to 4 in. long, entire or slightly toothed, shining above. Australia.

arborea: *Ampelopsis arborea.*

capensis (*Vitis capensis*). Roots tuberous: lvs. evergreen, orbicular or kidney-shaped, to 8 in. across, wavy-toothed, rusty-tomentose beneath. S. Afr.—Much planted in S. Calif.

discolor. Lvs. ovate, to 6 in. long, finely toothed, purplish beneath, tinged above with white, pink and purple. Java.—An old greenhouse "foliage plant."

gongylodes (*Vitis gongylodes* and *pterophora*). Sts. 4-angled and -winged, the branches bearing a terminal tuber to 6 in. long: lvs. of 3 lfts. which are often 3-lobed. Brazil.

hypoglauca (*Ampelopsis* and *Vitis hypoglauca*). Rusty-tomentose when young: lvs. of 5 obovate leathery lfts. to 3 in. long, toothed toward the apex, pale beneath. Australia.

incisa (*Vitis incisa*). MARINE IVY. Long climber, fleshy: lvs. of 3 ovate lfts. to 1 in. long, coarsely toothed or lobed: fls. in 3-parted clusters: fr. thickened below middle. Mo. to Fla. and Ariz.

oblonga (*Vitis oblonga*). Bushy tree: lvs. oblong, to 2½ in. long, entire, very obtuse. Australia.

quadrangularis (*Vitis quadrangularis*). Sts. 4-angled and -winged: lvs. ovate, entire or deeply 3-lobed, to 1½ in. long. Trop. Asia and Afr.

rhombifolia (*Vitis rhombifolia*). Lvs. evergreen, of 3 rhombic-ovate lfts. to 4 in. long, sharp-toothed, rusty-hairy on veins beneath. N. S. Amer.

striata. Lvs. evergreen, of 3–5 obovate or spatulate lfts. usually about 1 in. long, toothed at apex. S. Amer.—Has been cult. as *Vitis sempervirens.*

CISTACEÆ. ROCK-ROSE FAMILY. Shrubs or herbs of about 8 genera, characterized by simple entire lvs., regular bisexual fls. with 5 sepals of which 2 are small, 5 petals which usually fall early, numerous stamens, superior 1-celled ovary, and capsular fr.; mostly in the Medit. region and N. Amer. Only the genera Cistus and Helianthemum are known to general hort.

CISTUS. ROCK-ROSE. *Cistaceæ.* Low Mediterranean shrubs with opposite simple entire lvs., and showy wide-open white or purple fls. in terminal cymes or solitary; grown in the rock-garden; mostly evergreen or partially so.

Rock-roses prefer well-drained limestone soil and sunny exposures and will not stand many degrees of frost. Propagated by seeds which should be sown in pots as seedlings do not transplant well. Also increased by layers or cuttings under glass. The species are useful in California and stand in the southern states. They are plants long known to horticulture.

acutifolius: *C. corbariensis.*

albidus. To 6 ft.: lvs. ovate-oblong, to 2 in. long, densely white-tomentose: fls. lilac or rosy, 2½ in. across.

algarvensis: *Helianthemum ocymoides.*

canescens. Hybrid between *C. albidus* and *C. villosus*: lvs. oblong-lanceolate, tomentose: fls. dark purple.

corbariensis (*C. acutifolius*). Hybrid between *C. populifolius* and *C. salvifolius*: lvs. ovate, to 2 in. long: fls. white, 1½ in. across.

creticus: *C. villosus* var.

crispus. To 2 ft.: lvs. oblong-elliptic, 1 in. long, wrinkled: fls. deep rose, to 2 in. across. S. W. Eu.

cyprius. Hybrid between *C. ladaniferus* and *C. laurifolius*: to 6 ft.: lvs. oblong-lanceolate, to 3 in. long, white-tomentose beneath: fls. white with purple spot at base, 3 in. across.

florentinus. Hybrid between *C. monspeliensis* and *C. salvifolius*: lvs. lanceolate, to 1½ in. long: fls. white, 2 in. across.

halimifolius: *Helianthemum halimifolium.*

hirsutus. To 3 ft., hairy: lvs. elliptic-lanceolate, to 2½ in. long: fls. white, 1½ in. across. S. W. Eu.

ladaniferus. To 5 ft.: lvs. lanceolate, to 4 in. long, dark green and viscid above, white-tomentose beneath: fls. white, petals with purple spot at base, to 3½ in. across. Var. **albiflorus** has white fls. yellowish at base. Var. **maculatus** has a brownish-crimson spot above base. Var. **roseus** is a hort. name, probably referable to *C. villosus.*

laurifolius. To 8 ft.: lvs. ovate to ovate-lanceolate, to 2½ in. long, white- or brown-tomentose beneath: fls. white, petals with yellow spot at base, to 3 in. across.

Loretii. Hybrid between *C. monspeliensis* and *C. ladaniferus*: lvs. linear-lanceolate, to 2½ in. long, sticky, gray-pubescent beneath: fls. white with crimson spot at base, to 2½ in. across.

monspeliensis. To 5 ft.: lvs. lanceolate, to 2 in. long, wrinkled: fls. white, to 1 in. across.

populifolius. To 6 ft.: lvs. cordate-ovate, to 3½ in. long: fls. white, 2 in. across.

purpureus. Hybrid between *C. ladaniferus* and *C. villosus*: lvs. lanceolate, to 2 in. long: fls. purple, yellow at base with maroon spots, 3 in. across.

salvifolius. To 2 ft.: lvs. oval to oblong, to 1¾ in. long, wrinkled and tomentose: fls. white, petals with yellow spot at base.

tauricus: *C. villosus* var.

villosus. To 3 ft.: lvs. ovate-oblong, to 2½ in. long, gray-tomentose beneath: fls. purple or rose, to 2½ in. across. Var. **creticus** (*C. creticus*), lvs. smaller, fls. purple. Var. **tauricus** (*C. tauricus*), lvs. from roundish to lanceolate.

CITHAREXYLUM. *Verbenaceæ.* Shrubs or small trees with opposite simple lvs. and small fragrant yellow or white fls. in racemes; fr. a little drupe: planted out-of-doors in the lower S. They have something the look of wild cherry-trees, and are frequently seen in warm countries.

ilicifolium. Low shrub: lvs. leathery, to 2 in. long, entire or spiny-toothed: fls. white, in short racemes. Ecuador.

spinosum. Fiddle-Wood. Tree to 50 ft.: lvs. to 8 in. long, entire or coarsely toothed: fls. white, in slender racemes to 1 ft. long. W. Indies.

CITRANGE: see *Citrus Fruits* (page 156).

CITRANGEQUAT: see *Citrus Fruits* (page 156).

CITRON: *Citrus medica*; name also applied to a form of watermelon, for which see *Citrullus*.

CITRONELLA: *Collinsonia canadensis*.

CITROPSIS. African Cherry-Orange. *Rutaceæ*. Several trop. African small spiny trees mentioned as stocks for citrus frs. and for hybridizing, and of interest to cultivators: lvs. with 3, 5 or 7 lfts. and winged rachis and petiole: fls. large and white, borne in the lf.-axils; stamens 8: fr. small, in clusters. C. **Schweinfurthii** has 3–5 narrow-lanceolate acute lfts.: fr. like limes, 1½ in. diam., sweet.

CITRULLUS. *Cucurbitaceæ*. Tendril-bearing ann. and per. vines of a few species in S. and trop. Afr. and probably Asia, one extensively cult. for its edible frs. and also run wild in the western hemisphere: monœcious: fls. medium-size, solitary in axils, corolla 5-parted nearly to base.

vulgaris. Watermelon, which see. Ann., long-running, hairy; lvs. pinnately divided or dissected: fls. about 1½ in. across: fr. globular to oblong to cylindric, mottled or striped green, flesh red. Trop. and S. Afr. Var. **citroides.** Citron or Preserving Melon. Fr. small, with white hard flesh, used only for preserving: seeds not marked or marbled (as they usually are in watermelon).

CITRUS. *Rutaceæ*. Small or medium-sized evergreen sometimes spiny trees of trop. and subtrop. Asia and regions beyond, comprising several much-prized citrus frs., as orange, lemon, lime, citron: lvs. compound but reduced to a single lft. (developed lfts. may appear on young strong shoots): fls. clustered in the axils or in cymes or sometimes solitary, white or pink and usually very fragrant; stamens 15 or more: fr. mostly thick-skinned, 8–15-celled, juicy, pulpy and aromatic, the kind known as a hesperidium. Propagated by seeds and by grafting on seedlings. For cult. see *Citrus Fruits*.

aurantifolia (*C. Limetta* in part). Lime. Small very tender tree with sharp spines: lvs. small, petiole narrowly winged: fls. white: fr. oval, 1½ in. or less diam., thin-skinned and smooth, greenish-yellow, very acid. Probably India and S. E. Asia.—Much grown in W. Indies.

Aurantium (*C. Bigaradia. C. vulgaris*). Sour or Seville Orange. Medium tree with rather blunt spines: petioles broadly winged: fls. white: fr. sour, with a hollow core when ripe, usually with loose skin, globose and somewhat flattened, to 3¼ in. diam. Probably Cochin-China.—*C. myrtifolia* is a short-jointed narrow-lvd. form, useful as a pot plant.

Bergamia. Bergamot. Small spiny tree: lvs. oblong-oval, petiole winged: fls. small, white: fr. pyriform, sour, thin-skinned, 3–4 in. diam.—Grown in Eu. for the essential oil and perfume, and sometimes for curiosity here.

Bigaradia: *C. Aurantium*.

decumana: *C. maxima*.

deliciosa: *C. nobilis* var.

grandis: *C. maxima*.

ichangensis. Small slender-spined tree from S. W. (Ichang region) China, grown somewhat as an ornamental Fla. to Miss.: lvs. narrow-oblong, not much broader than the winged petiole: fls. white: fr. lemon-form, 3–4 in. long, acid.

japonica: *Fortunella japonica*.

Limetta: *C. aurantifolia*.

Limonia. Lemon. Small tree with short spines: lvs. long-ovate, petiole not winged: fls. reddish-tinted in bud: fr. oval or oblong with a terminal nipple, 3–5 in. long, very sour. Probably farther Asia.

maxima (*C. decumana. C. grandis*). Shaddock. Pummelo. Pompelmous. Very tender tree 15–30 ft. high: lvs. large, 4–8 in. long, somewhat pubescent underneath, petiole widely winged: fr. very large, borne singly, flesh coarse-grained and the segms. often separating readily, oil-glands of rind few and large. See *C. paradisi*. Scarcely known in U. S.; native probably of Malaya and Polynesia.

medica. Citron. Large thorny shrub or small tree: lvs. oblong, 4–7 in. long, serrate, petiole wingless: fls. large, clustered, reddish in bud: fr. oval or oblong, 6–10 in. long, rough or warty, with scant acid pulp. Probably farther Asia.—Grown in S. Eu. for the peel which is candied; sometimes planted in Fla. and Calif. for interest, being a striking fr.

mitis. Calamondin or Panama Orange. Small thick-topped tree, spineless or with few very short prickles: lvs. broad-oval, petiole very narrowly winged: fls. small: fr. borne on tips of branches, globose or oblate, to 1¼ in. diam., with loose skin and acid pulp. Philippines.—One of the hardiest comestible citrus frs.: used same as limes and lemons.

myrtifolia: see *C. Aurantium*.

nobilis. King Orange. Small tree, thornless or nearly so, with small lanceolate to oval lvs. and short petioles nearly or quite wingless: fls. small and white: fr. oblate, orange or reddish, with rather loose peel and hollow pith, sweet or subacid, segms. separating from each other and from the rough rind. Cochin-China. Var. **deliciosa.** Mandarin and Tangerine Oranges. Lvs. willow-like: fr. small, depressed-globose, with nearly or quite smooth loose thin skin, yellow to reddish, all parts separating freely. Sometimes called kid-glove orange. Var. **unshiu.** Satsuma Orange. Lvs. broad, large, rounded at apex: fr. medium, depressed-globose, pulp orange, of fine quality. Hardiest of the sweet oranges.

paradisi (*C. maxima* var. *uvacarpa*). Pomelo. Grapefruit. Larger and hardier tree than the pummelo (*C. maxima*) with smooth lvs.: frs. large and borne close together forming clusters, relatively fine-grained, with many small oil-glands in the rind. Much grown in U. S.; origin unknown.

sinensis. Common or Sweet Orange. Medium tree, with rather blunt spines or none: lvs. oblong-ovate, more or less acuminate, petiole narrowly winged: fls. white: fr. subglobose or oval, with solid core and sweet pulp. China or Cochin-China.—The Navel orange is a form with supernumerary carpels.

taitensis. Otaheite Orange. Small, usually a little bush, of unknown origin, sometimes grown as a pot plant: lvs. oblong to elliptic, finely crenulate, petiole narrowly winged: fls. pink outside, fragrant: fr. lemon-shaped, about 2 in. long, ornamental.

trifoliata: *Poncirus trifoliata*.

vulgaris: *C. Aurantium*.

CITRUS FRUITS. The genus Citrus, with its allies, yields several fruits of major importance in semi-tropical regions of the world. The present article presents a general discussion of citrus fruits from the pomological point of view, and then separate discussions of certain ones of them as follows (see also *Citrus*):

Sweet oranges, page 154
Sour orange, page 155
Calamondin, page 155
Kumquat, page 155
Trifoliate orange, page 155
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Lemon, page 156
Lime, page 156
Limequat, page 157

Among subtropical fruits those belonging to the citrus group are the most important and they are grown the world around in regions suited to them. In the continental United States they are produced most largely in California and Florida, and to a lesser extent in the Rio Grande Valley in Texas, in Arizona, and the warmer sections of the Gulf states.

None of these citrus regions is free from the effects of frost, and the extension of culture northward is definitely limited by winter temperatures. Within the group, which includes the lime, lemon, grapefruit, orange, tangerine or mandarin, satsuma, calamondin and kumquat there is a marked variation in their cold resistance. Roughly they are hardy in the order named and while the lime requires an almost frostless climate and succeeds well in the tropics, the kumquat has withstood temperatures down to about 12° or 15° F. Indeed it is doubtful whether the best citrus fruits of some kinds can be grown outside those regions in which frosts occur at intervals during their ripening season.

Soils varying from very light sand to heavy sticky clay are capable of producing citrus fruits. A careful survey of older plantings, however, makes it plain that many soils on which groves are planted are not satisfactory and should have been avoided. If soils are too light and sandy, it is more difficult and expensive to maintain fertility and the optimum of organic matter so necessary to the welfare of the trees. On the other hand, those that are too heavy and sticky are difficult to handle and are likely to be poorly drained. The necessity for adequate drainage must be emphasized, as nothing is more inimical to the welfare of the trees than the presence of stagnant water. A deep mellow rather open soil is desirable.

Propagation of citrus trees for orchard planting is by shield-budding desired varieties on two- or three-year seedling stocks of the same or other species. Seedling sweet orange, sour orange, grapefruit, rough lemon and trifoliate orange have all been employed, but propagation is now limited mostly to sour orange, rough lemon and trifoliate orange. Sour orange is used for lands of good quality, rough lemon for light sandy soils, and trifoliate orange for heavier soils with good moisture supply in the colder districts. Rough lemon is the most tender of the three. Seeds are sown in rows or drills much as are garden peas. They are liberally supplied with fertilizer and usually the seed-beds are irrigated. At the end of twelve to eighteen months, the seedlings are large enough to plant out in the nursery rows. About 8000 are set to an acre. Selection is made at time of transplanting and only the most vigorous seedlings saved. In the nursery rows they are grown for one or two years, when they are budded.

Best results follow dormant budding in autumn, thus giving a full growing season when the buds start in spring. Just before the buds push out, the stocks are cut off with a sloping cut. As soon as the buds are started, a stake is set against each one and the growing shoot trained and tied to it until a height of 24 to 30 inches is reached, where the top of the bud growth is cut off to force branching. At the end of the season's growth they are ready for transplanting or they may be allowed to remain a year or two longer.

Planting of nursery trees in the grove is usually in winter, but to a limited extent they are also set during the early summer season in the Southeast. If rains are sufficient and frequent enough, this can be undertaken successfully. The usual planting distances are 25 to 30 feet for oranges and grapefruit, 20 to 25 feet for tangerines and lemons and 15 feet for kumquats. It is important that trees should be set no deeper than they grew in the nursery, with earth well packed about the roots and in the drier districts watered copiously.

Cover-crops and tillage must receive careful attention. The maintenance of an adequate supply of organic matter in citrus soils is important. It is impossible to keep a planting in good condition unless the humus is adequate. In California and other irrigation districts this is accomplished by growing cover-crops in winter, while in the southern and southeastern sections they are commonly grown in the summer season. In the first instance they are raised in winter because water is then available, while in the latter they do the useful work of using up the surplus moisture supplied by summer rains. In the West the favorite cover-crops are vetch, Canada field peas and bur clover, while in the East cowpeas, velvet beans, beggarweed and crotalaria are used. Occasionally groves are grown in sod, grass in the East and alfalfa in the West.

Citrus groves or orchards are usually clean-tilled in the eastern districts from early spring, when growth starts after the winter dormant season until about the first of July, when the summer rainy season starts; and in the western irrigation sections throughout the summer. Once every week or ten days is usually sufficient to keep down weed growth and maintain a dust blanket for the conservation of moisture. Disk, spring-tooth or acme harrows are employed. In autumn the groves are either plowed or disked to incorporate the summer cover-crop in the soil and as a safeguard against cold and fire.

Irrigation is essential in the western districts, with an insufficient rainfall of about 25 inches; sufficient water is added to meet the requirements of the trees. Thus a total of 40 to 45 inches is secured. Irrigation and cultivation are alternated. In the southeastern districts irrigation is seldom practiced.

Fertilizers are applied to citrus plantings to supply nitrogen, phosphorus, and potash. In some sections, as in Florida, the use of commercial fertilizer is an important part of successful citrus culture. Indeed, there are few locations in that area where their judicious and continued use is not necessary, and results are usually in direct proportion to their liberal use. In California, on the other hand, soils commonly contain sufficient phosphorus and potash and only fertilizers containing nitrogen are useful.

The common practice in Florida is to make three applications each year, February, June, September or October. Young trees receive applications containing relatively higher amounts of nitrogen or ammonia, while bearing trees receive larger amounts of phosphorus or phosphoric acid and potash. A standard formula for young trees in Florida contains 6 per cent phosphoric acid, 5 per cent potash and 4 per cent ammonia, while a mixture for fruiting trees will contain about 8 per cent phosphoric acid, 10 per cent potash and 3 per cent ammonia. The amount required will depend on the size and age of the trees and the crop carried. It will vary from 4 or 5 pounds each for young trees to 50 or more pounds for old trees in full bearing. Application may be made by machinery, but fertilizer is more frequently scattered by hand, being evenly distributed fairly close to and around young trees and over the whole surface of the ground in old established groves. Immediately after being applied the ground is usually cultivated.

Pruning nursery trees, one to three years old, is by cutting back to 18 to 24 inches at time of planting, thus insuring low branched heads. No further pruning is undertaken for a year or two unless to remove sprouts that have come from below the bud union. The first pruning after the trees are well established consists in removing all branches from the original stem except four or five chosen to form the framework of the tree.

It is the habit of citrus trees to grow with shapely symmetrical heads and comparatively little pruning is required to secure this end. Too numerous sprouts are removed from time to time. Dead branches are taken out. If these are the result of frost injury it is best to allow sufficient time for new shoots to grow before pruning away the dead parts; by so doing much unnecessary labor is avoided. Neglected or out-of-condition trees can often be rejuvenated by heading back.

Harvesting, marketing, yields vary greatly in different regions. Citrus fruits are in the markets in quantity the year around. The Florida crop, consisting of oranges and grapefruit, is marketed from October 15th to July 1st. California oranges are shipped the year around, the navel orange crop moving from November to May and the Valencia oranges from June to October. Lemons are harvested in California to some extent every month in the year, the heaviest cropping season being in February, March and April. Limes are harvested in greatest quantity in the summer months. Oranges and grapefruit are allowed to mature on the trees. If picked green, maturity is checked and the product is unsatisfactory. The shipment of green fruit is prohibited by law. Lemons and limes are picked when still green although they must have reached a certain size and degree of maturity. Lemons are cured and ripened before shipment. Limes are shipped while still green but have usually colored wholly or in part when seen on the markets.

Citrus fruits of all kinds are gathered carefully to prevent bruising or injury to the rind, each individual fruit being cut closely with short stems and smooth cuts. Special clippers are used for the purpose. As a rule the crop is prepared for packing in large centralized packing-houses by washing and polishing, graded by hand and sized by machinery, wrapped and packed by hand in standard boxes. When loaded in cars for shipment the boxes are stood on end and securely cleated or braced in place to prevent shifting. The bulk of the American crop is sold through cooperative marketing agencies. The total crop approximates 60,000,000 boxes annually. An average of three boxes a tree for oranges and five boxes for grapefruit is a good yield at ten to twelve years.

Insects and diseases are numerous, although many of them are of minor importance. The greater portion of the damage from year to year is credited to purple scale, red scale, black scale, whitefly and rust mite among insects, and stem-end rot, scab, melanose, anthracnose and brown-rot among diseases. The fungus diseases are more troublesome in moist climates than in dry ones and insects more difficult to control in dry climates than in moist ones. In damp climates insects are held in check to a considerable extent by the attacks upon them by friendly parasitic fungi.

In the Florida and other southern districts insect and disease control is almost entirely by spraying with bordeaux mixture and lime-sulfur wash, while in California fumigation with hydrocyanic acid gas is the favorite method against most insects. The popular sprays against insects are miscible oil and lime-sulfur wash. In all sections powdered sulfur in different combinations is employed for dusting to control red-spider and rust or silver mite.

Sweet oranges

The sweet oranges of grove cultivation and the markets are botanically *Citrus sinensis*, of numerous varieties. Products of these plants far surpass all other citrus fruits in quantity produced and the esteem in which they are held. The crop for 1928 produced in Florida was 13,000,000 boxes and 31,000,000 boxes in California. Its cultivation in these states goes back to the earliest beginnings of fruit-growing, and orange culture with its related industries has become a commercial enterprise of vast proportions. Interest in planting and cultivation has had much to do with the development of those sections in which oranges are grown. American markets are supplied almost entirely from domestic sources.

Orange culture in America was started with trees raised from seed, and many seedling plantings are still in bearing. The product of these groves still makes up a large part of the Florida midseason crop, while a relatively smaller amount is still marketed from California. Many seedling trees have been topworked. Numerous seedling varieties have been selected, propagated by budding and planted, but in later years the number has been greatly reduced.

A large number of varieties, such as Valencia, Majorca, Jaffa and Ruby were introduced from Mediterranean countries and elsewhere. Few of these have gained a permanent place in grove plantings. As the growing of citrus fruits has become a great commercial enterprise, the standardization of cultural practices and marketing procedure has made it necessary to limit more recent plantings to a smaller number of varieties of proved merit.

Climatic conditions in California make it possible to cover a twelve-month shipping season with two varieties, the Bahia or Washington Navel (from Brazil) covering the period from November to April and May, and the Valencia (from Spain) covering the season from May or June to November. A miscellaneous crop of seedling and other varieties is marketed in May and June.

It is necessary to use a larger number of varieties in Florida to cover the shipping season from October to July. In order of their ripening from early to late the varieties commonly planted are Hamlin and Parson Brown, Homasassa, Pineapple, Valencia and Lue Gim Gong. All except Valencia are seedlings of local origin.

Of the Nobilis oranges, Dancy is grown in California and Dancy and King in Florida; the tangerine is also popular with growers in places. Temple, a very excellent variety when grown on sour orange stock, has been planted to a considerable extent in Florida in recent years. Satsuma, an early hardy variety, is cultivated in northern and western Florida, and the coastal sections of Alabama, Mississippi, Louisiana and Texas.

Sour orange

In Spain the sour orange, *Citrus Aurantium*, is grown for its fruit and some of the most beautiful plantings in that country are of this species. In America, however, the sour orange is not a cultivated fruit in the usual accepted sense of the term. Such trees as occur here and there are either those that are feral on the shores of lake and river or in similar locations, as in Florida, or are to be found in plantings of sweet oranges when the top variety has died out and the stock has sprouted and taken its place. Under these conditions the trees are usually neglected and ill-kept. The fruit of the sour orange is valuable in the making of orangeade and marmalade. For the latter purpose it is widely and largely employed and the quality of the product is scarcely surpassed by that secured from any other citrus. Seedlings are largely used for stock on which to grow many other kinds of citrus. The stock is adapted to heavy and moist soils of good depth; it is very hardy, remarkably resistant or immune to foot-rot and gum diseases. On it a high quality fruit is produced and in a world-wide way it is more commonly used than any other stock.

Calamondin

The calamondin, *Citrus mitis*, is unique among citrus fruits in being the hardiest of the acid species now grown in America. Its dense head with bright green leaves, upright habit, and small fruits resembling tangerines in shape and color make it one of the most ornamental of the citrus allies. The fruits are bright orange-red, 1–1½ inches in diameter, with deep orange flesh. The juice is well flavored and very acid. It is a valuable garden fruit adapted to those sections where the Satsuma orange and kumquat are grown. Among ade-making fruits it is unsurpassed.

Kumquat

The kumquats, the smallest both in size of plant and fruit among the citrus in cultivation in America, are closely related to the genus Citrus. Commonly they are grown as shrubs, the largest reaching a height of 12 feet or so with a head diameter of about 8 feet. The tops are dense and when well fruited the plants are very ornamental.

Three kinds representing as many species are grown. These are Nagami (*Fortunella margarita*), Marumi (*Fortunella japonica*), Meiwa (*Fortunella crassifolia*). The fruits of Nagami are oblong, 1¼ by 1½ inches, with acid juice; those of Marumi are round, 1¼ inch in diameter, acid; those of Meiwa are round, 1½ inch in diameter, with sweet rind and almost juiceless pulp. They are grown as ornamental shrubs, the fruits are used for decorations and in the making of jellies and fine marmalades. They are propagated on trifoliate orange and rough lemon stocks and commonly planted 15 feet apart when grown in orchards.

Trifoliate orange

The trifoliate or three-leaved orange is *Poncirus trifoliata* (formerly known as *Citrus trifoliata*). The fruit is not eaten, but the plant is prized for its hardiness as an ornamental and hedge plant, as far north as Washington and Philadelphia; for use as stocks on which to work sweet oranges; and as a parent in hybridization in the procuring of hardy races and of fruits superior for the making of ades (see *Citrange*, next page). Trifoliate seedlings are extensively grown as orange stocks, to be employed on the northern limits of orange culture and for moist deep rich soils.

Citrange

Citranges are hybrids between sweet oranges and the trifoliate orange. They are hardier than oranges and are adapted to northern Florida and southern Georgia and warmer parts of the cotton-belt; the fruits are prized for culinary uses and in the making of beverages or ades. Usually the fruit is small, 2–3 inches in diameter, but in some cases is much like a sweet orange in external appearance. Varieties Colman, Morton, Rusk, Rustic, Savage are as yet the most prominent. They are also ornamental plants with fragrant flowers. They are propagated on trifoliata stock.

Citrangequats are secondary hybrids, produced by crossing citranges and kumquats. They are hardy north of the usual citrus-belt. The fruits are yellow to orange and reddish, 1½–2 inches diameter, useful to ades and culinary uses. They are worked on trifoliata stocks.

Grapefruit

Once considered to be of the same species as the shaddock, the grapefruit or pomelo is now regarded as a distinct species, *Citrus paradisi*. The culture of grapefruit, essentially an American enterprise, has been developed in Florida to a greater extent than in other citrus districts of the continental United States, although also grown in southern Texas and California. The fruit was unknown to early European citrus growers; there is evidence that it originated as a seedling sport in the West Indies and its introduction into the United States, probably about 1809, was much more recent than that of the sour or sweet orange. The first fruit was marketed from Florida about 1880 or 1885. Plantings have been increased greatly, and it has seemed, at times, that there was certain to be over-production. The market outlook, however, has been improved greatly by the use of very considerable amounts of fruit in canning the pulp and juice. It appears that this disposal of part of the crop will be greatly extended and that canneries will assist materially in returning a profit to the growers.

Here and there small seedling grapefruit groves are to be found, but in a large way the fruit marketed is the product of budded trees. The varieties are of Florida origin, selections from earlier plantings of seedling trees. The number of varieties introduced from time to time is much less than that of sweet oranges. Present plantings are usually made with Duncan, McCarty, or Marsh. Other varieties are Walters, Hall, and occasionally Triumph. The last is a small-sized early sort. Marsh is the favorite variety in California. When varieties containing seeds are held late on the trees, the seeds sprout and the flavor of the fruit is impaired. Marsh is favored as a late variety because it is seedless. Duncan is hardy and unsurpassed in quality. Two pink-fleshed varieties, Foster and Thompson, are grown somewhat in groves and as garden fruits.

Shaddock

This fruit, *Citrus maxima*, has taken its name from Captain Shaddock who is credited with having brought it to Barbados some time prior to 1707. It is also properly called pummelo. In the far East it is known as pompelmous. By some writers it has been regarded as the progenitor of the grapefruit. It is of no commercial importance in N. America but is occasionally found in the warmer citrus districts where its large glossy foliage and huge fruits (sometimes weighing several pounds) make it an interesting and valued garden plant. Since it is tender, its cultural range is limited.

Lemon

Of the acid citrus fruits, the lemon (*Citrus Limonia*) is the most widely and largely grown in commercial plantings. The success achieved in the culture of the lemon in California is one of the outstanding horticultural developments of recent years. Elsewhere in American citrus districts it is grown only as a garden fruit. At one time considerable quantities of lemons were raised in Florida, but a combination of difficulties, among which may be mentioned cold weather, scab and other diseases, and troubles in curing, led to the abandonment of the plantings.

The lemon is hardier than the lime but less hardy than the orange and, consequently, unless adequate protection can be given, its cultivation is limited to warmer locations than are required for that fruit. In addition to this lack of hardiness the lemon is perhaps less resistant to certain diseases than either the orange or grapefruit. Lemons are picked green when they have reached a diameter over 2¼ inches. This is determined by passing them through a ring of that size. Those that pass through are allowed to remain and increase in size. They are cured to shrivel the rind and become light yellow in color before marketing. The greater care in picking and curing add materially to the cost of handling. Losses sometimes occur in curing.

The principal varieties planted in California are Lisbon and Eureka. The latter is the favorite. In Florida the variety usually planted is Villa Franca.

Lime

The acid lime (*Citrus aurantifolia*) is a distinctly tropical fruit. It is grown in the tropics the world around and, because it is very tender, its culture does not extend far outside that region. In southern California it is grown as a home garden fruit, while in extreme southern Florida it is a crop of considerable importance. It is also grown in the latter state as a garden fruit for considerable distances north of the commercial areas.

The greater part of the lime crop that finds its way into the markets both from Florida and from the tropics is the product of seedling trees. Usually this fruit is named for the point of origin, as Key, West Indian, or Mexican lime. The trees are very thorny and very thick-headed and receive a minimum of attention in pruning, cultivation and fertilizer; they are much like wild trees. The fruit is thin-skinned, small, and very acid. It is produced to some extent the year around but the season of heaviest production is the summer months. Named varieties, as Tahiti in Florida, propagated on rough lemon stock, and Bearss in California, are commonly planted in gardens or in small groves for home use and local market. They are the size of large-fruited lemons. Rangpur from India is not a true lime and is much hardier. It is orange-red in color and very acid.

Limequat

In an effort to secure a hardy acid fruit, Walter T. Swingle in 1909 crossed the Marumi kumquat on the West Indian lime. This cross gave rise to a new citrus fruit named "limequat" of which three varieties were described. Only one, Eustis, has come into cultivation. Its color is a very light yellow, like that of a grapefruit, oval in outline, 1⅞ inches long, with a sweet rind and very acid pulp. The flavor is distinct and agreeable. It is very prolific. In hardiness it surpasses the sweet orange and its cultural range is about the same as that of the kumquat and Satsuma orange. Even though frozen back partially it grows out rapidly and usually bears fruit the following season. Plantings have proved profitable and there is no reason why it cannot be used in extending the area in which acid citrus may be grown. Limequat can be propagated satisfactorily on rough lemon and trifoliate orange stock.

CLADANTHUS. *Compositæ.* One herbaceous strong-smelling ann. native in S. Spain and Morocco and sometimes grown in the flower-garden. **C. arabicus** (*C. proliferus. Anthemis arabica*). To 3½ ft.: lvs. alternate, finely divided: heads solitary and others arising from beneath them, yellow, of ray- and disk-fls.; pappus none.

CLADRASTIS. Yellow-Wood. *Leguminosæ.* Deciduous trees native in N. Amer. and E. Asia, with pinnate lvs., white papilionaceous fls. in usually panicled racemes, and flattened pods; planted for ornament. See *Maackia*.

Propagated by seeds in spring, and by root-cuttings kept over winter in moderately cool and moist sand or moss.

amurensis: *Maackia amurensis.*

lutea (*C. tinctoria. Virgilia lutea*). To 50 ft.: lvs. of 7–9 ovate lfts.: fls. 1 in. long, fragrant, in June: pods to 4 in. long. S. E. U. S.

platycarpa (*Sophora platycarpa*). To 60 ft.: lvs. of 7–15 ovate lfts.: fls. ½ in. long, white with yellow spot at base: pods to 3 in. long, winged all around. Japan.

sinensis. To 80 ft.: lvs. of 9–13 oblong lfts.: fls. ½ in. long, June–July: pods to 3 in. long. China.

tinctoria: *C. lutea.*

CLARKIA. *Onagraceæ.* Ann. herbs with alternate lvs., rose or purple showy fls. in racemes or solitary, and linear capsular frs.

Grown in flower-gardens and latterly as greenhouse subjects for winter and spring bloom. Of easy cultivation in sunny situations. Propagated by seeds sown where plants are to stand in the open.

Breweri: *Eucharidium Breweri.*

concinna: *Eucharidium concinnum.*

elegans. To 3 ft. (more under glass), with reddish glaucous sts.: lvs. ovate to ovate-lanceolate: fls. purple or rose or white in var. **alba**, sometimes double; claws of petals not toothed or notched. Calif.

grandiflora: *Eucharidium concinnum.*

pulchella. To 1½ ft.: lvs. linear to linear-lanceolate: fls. lilac varying to white in var. **alba**, the claws of petals toothed. B. C. to Calif. Var. **holopetala** (var. *integripetala*) has entire petals.

CLARY: *Salvia Sclarea.*

CLASPING: leaf partly or wholly surrounding stem.

CLAUSENA. *Rutaceæ.* Several species of spineless trees in trop. Asia, Australia and Afr., with pinnate lvs. and small fls. in racemes or terminal panicles; stamens 8–10: fr. berry-like, small and globose, 4–5-celled. **C. punctata** (*C. Lansium. C. Wampi*). Wampi. Small tree sometimes planted far S. for ornament or interest: lfts. 5–9, ovate-elliptic, more or less punctate: fr. ovate-globose, about 1 in. long. China, where it is sometimes cult. as a fruit-tree; can be grafted on Citrus.

CLAVATE: club-shaped; said of a long body thickened toward the top.

CLAVEL DE LA INDIA: *Ervatamia coronaria.*

CLAVIJA. *Theophrastaceæ.* Evergreen trees or shrubs with unbranched trunk bearing at top a cluster of stiff simple lvs. with spike-like racemes of unisexual fls. in the axils; fls. white, yellow or orange; native in trop. Amer. and one intro. in S. Calif. Propagated by seeds and cuttings of half-ripe wood.

longifolia (*C. ornata*). Diœcious tree to 20 ft.: lvs. to 2 ft. long and 6 in. wide, with few spiny teeth: fls. small, deep orange, the staminate fragrant, in drooping racemes to 10 in. long. Trinidad, S. Amer.

ornata: *C. longifolia.*

CLAW: the long narrow petiole-like base of petals or sepals in some flowers.

CLAYTONIA. Spring Beauty. *Portulacaceæ.* Succulent little spring-blooming perennials having deep-seated hard corm or tuber, 2-lvd. sts., white or rose fls. in terminal racemes, and capsular frs.; sometimes transplanted from the wild to moist shady positions and rock-gardens.

caroliniana. Per. to 1 ft.: lvs. broad in middle, to ¾ in., obtuse, those on st. with distinct petiole. E. N. Amer.

perfoliata: *Montia perfoliata.*

virginica. Per., sts. to 1 ft. long: lvs. linear or linear-lanceolate, about ½ in. broad: fls. white tinged with pink, ¾ in. across. E. N. Amer.

CLEISTOCACTUS. *Cactaceæ.* Slender erect or clambering plants known by the fl. remaining closed or the perianth-limb not expanding, of S. S. Amer.: spines many and slender and very sharp; ribs many, not prominent, the areoles close together: fls. orange-red. See *Cacti.*

Baumannii (*Cereus Baumannii. C. colubrinus*). St. columnar and flexuose, to 6 ft. and 1½ in. diam., with few erect branches and fascicled spines most of them about ¼ in. long. Uruguay, Paraguay, Argentina.

CLEISTOGAMOUS FLOWERS: small closed self-fertilized flowers, as in some violets; they are mostly on or under the ground.

CLEISTOYUCCA: *Yucca.*

CLEMATIS. CLEMATIS. VIRGINS-BOWER. *Ranunculaceæ.* Per. herbs or woody climbing vines with opposite usually compound lvs., solitary or panicled fls. without petals but with petal-like sepals and numerous stamens (unless otherwise stated the fls. open wide and flat), and fr. an achene with commonly a long feathery style; mostly native in the north temp. zone, and many of them much prized for ornament.

Clematis prospers in fertile light loamy soil which is well drained. Propagated by stratified seeds, layers, division, and cuttings under glass in summer. Varieties may be grafted on roots of *C. Flammula* or *C. Viticella*; roots should be taken from plants out-of-doors to avoid nematode infection, and cions from those grown in a greenhouse.

Some of the clematises are perennial herbs and should be treated as such in the border. Others are small-flowered woody vines not much modified by domestication, planted for permanent cover of fences, arbors and porches. Others are large-flowered highly developed hybridized kinds, usually not very woody, as *C. Jackmani*, grown specially on trellises and posts; they bloom on wood of the season and should be pruned when dormant; in fact, they may be cut back to the ground each year; where the ground freezes about the roots, the nematode disease is not prevalent.

apiifolia. Climbing to 10 ft.: lvs. of 3 toothed or lobed lfts., sometimes biternate: fls. white, about ½ in. across, in axillary panicles, Sept.–Oct. Japan.

Armandi. Evergreen, climbing to 15 ft.: lvs. of 3 entire leathery lfts.: fls. white, to 2½ in. across, in axillary leafless panicles, in spring. China. Var. **Farquhariana** has light pink fls.

Baldwinii (*Viorna Baldwinii*). PINE-HYACINTH. Erect herb to 1½ ft.: lvs. simple or the upper ones of 3 lfts.: fls. urn-shaped, purple or pinkish, about 1 in. long, solitary and nodding, in early spring. Fla.

balearica. Climbing: lvs. of 3 toothed or 3-lobed lfts.: fls. greenish-yellow spotted with red inside, in spring. S. Eu., Asia Minor.

brevicaudata. Climbing: lvs. bipinnate, lfts. toothed or entire: fls. white, to ¾ in. across, in axillary cymes, Aug.–Oct. Manchuria, W. China.

Catesbyana (*C. holosericea*). Climbing: lvs. mostly biternate, lfts. lobed or entire: fls. white, 1 in. across, in panicles, spring and summer. S. C. to Fla. and Miss.

chinensis. Climbing to 10 ft.: lvs. of usually 5 entire lfts.: fls. white, to ¾ in. across, in axillary leafless panicles. China to Indo-China.

chrysocoma. Erect or climbing to 20 ft.: lvs. of 3 coarsely toothed or 3-lobed lfts., yellow-pubescent: fls. white or pinkish, 2 in. across, in clusters, June–Sept. China. Var. **sericea** (*C. Spooneri*). Fls. to 3½ in. across, from old wood.

cirrhosa. Climbing to 10 ft.: lvs. simple, toothed or sometimes lobed: fls. yellowish-white, to 2 in. across, 1–2 in the axils, Mar.–May. S. Eu., Asia Minor.

coccinea: *C. texensis.*

columbiana: the western representative of *C. verticillaris*: fls. blue or purple, with narrow pointed sepals and narrow mostly entire lfts.

crispa (*C. cylindrica. Viorna crispa*). Climbing to 10 ft.: lvs. of 3–7 thin entire or lobed lfts.: fls. urn-shaped, bluish-purple, to 1½ in. long, solitary and nodding, fragrant, June–Sept.: achenes without plumose styles. Va. to Fla. and Tex.

cylindrica: *C. crispa.*

Davidiana: *C. heracleæfolia.* var.

dioscoreæfolia: *C. paniculata* var.

Douglasii. Erect herb to 2 ft.: lvs. 2- or 3-pinnate into linear or linear-lanceolate lfts.: fls. tubular, purple inside, paler outside, to 1½ in. long, solitary, May–July. Colo. to Wash.

erecta: *C. recta.*

eriophora (*Viorna eriophora*). Erect white-hairy herb to 1½ ft.: lvs. 2-pinnate into linear lfts.: fls. bell-shaped, purple, about 1 in. long, solitary and nodding, May–June. Wyo. to New Mex.

eriostemon (*C. Hendersonii. C. intermedia*). Hybrid between *C. Viticella* and *C. integrifolia*: subshrub to 10 ft. with blue fls. to 2½ in. across.

Flammula. Climbing to 15 ft.: lvs. 2-pinnate, the lfts. entire or lobed: fls. white, fragrant, about ¾ in. across, in many-fld. panicles, Aug.–Oct. Medit. region to Persia.

florida. Climbing to 12 ft.: lvs. usually biternate, the lfts. entire or lobed: fls. creamy-white with green band on back and purple stamens, to 4 in. across, solitary, June–July: styles not plumose. Cent. China. In var. **plena** the fls. are double. In var. **Sieboldii** (*C. Sieboldii*) part of the stamens are changed to purple staminodia.

Fortunei: *C. patens* var.

Fremontii (*Viorna Fremontii*). Erect herb to 1½ ft.: lvs. simple, leathery and reticulated, sessile: fls. bell-shaped, purple, 1 in. long, solitary and nodding, spring and summer. Mo. to Neb.

grata. Climbing: lvs. usually of 5 coarsely toothed lfts.: fls. white, to ¾ in. across, in panicles, Sept.–Oct. Himalayas.

graveolens: *C. orientalis.*

Hendersonii: *C. eriostemon.*

Henryi: *C. Lawsoniana* var.

heracleæfolia. Erect herb to 4 ft., woody at base: lvs. of 3 large coarsely toothed lfts.: fls. tubular, polygamous, to 1 in. long, blue, in axillary clusters, Aug.–Sept. China. Var. **Davidiana** (*C. Davidiana*) has diœcious fragrant deep blue fls.

holosericea: *C. Catesbyana.*

indivisa. Climbing, with thick woody sts.: lvs. of 3 leathery entire or lobed lfts.: fls. diœcious, white, to 4 in. across, in axillary panicles, in spring, or winter when grown indoors. New Zeal.

integrifolia. Erect herb or subshrub to 3 ft.: lvs. thin, simple and entire, sessile: fls. urn-shaped, blue, to 1½ in. long, solitary and nodding, June–July. Eu., Asia.

intermedia: *C. eriostemon.*

Jackmani. A group of hybrids between *C. lanuginosa* and *C. Viticella*: climbing to 10 ft.: lvs. pinnate or the upper simple: fls. violet-purple, to 6 in. across, usually in 3's and forming terminal panicles.

koreana. Prostrate: lvs. of 3 toothed lfts. which are lobed or parted: fls. yellow or violet, solitary and nodding. Korea.

lanuginosa. Climbing to 6 ft.: lvs. simple or of 3 entire lfts.: fls. lavender or white, to 8 in. across, 1–3 together, July–Sept. China.

lasiantha. PIPESTEM C. Climbing: lvs. of 3 coarsely toothed or lobed lfts: fls. polygamous, white, to 2½ in. across, fragrant, 1–3 together, Apr.–May. Calif.

Lawsoniana. A group of hybrids between *C. lanuginosa* and *C. patens*: lvs. usually ternate: fls. rose-purple with darker veins, to 6 in. across, solitary. Var. **Henryi** (*C. Henryi*) has creamy-white fls.

ligusticifolia. Climbing to 20 ft.: lvs. of 5–7 coarsely toothed or 3-lobed lfts.: fls. diœcious, white, ¾ in. across, in cymes, Aug.–Sept. B. C. to Calif. and New Mex.

mandschurica: *C. recta* var.

montana. Climbing to 25 ft.: lvs. of 3 cut-toothed lfts.: fls. white turning pink, with yellow stamens, to 2 in. across, in 1–5-fld. clusters, fragrant, May–June Himalayas, China. Var. **grandiflora** has fls. to 3 in. across. Var. **rubens**, fls. rose or pink, lvs. purplish Var. **undulata** is a cross between *C. montana* and *C. gracilifolia*, with large bluish-white fls. Var. **Wilsoni** has fls. to 3 in. across.

ochroleuca (*Viorna ochroleuca*). Erect herb to 2 ft. lvs. simple and entire, sessile: fls. bell-shaped, yellow ¾ in. long, solitary and nodding, May–June. N. Y. to Ga.

orientalis (*C. graveolens*). Climbing to 20 ft.: lvs pinnate or bipinnate, the lfts. coarsely toothed or lobed: fls. yellow, to 2 in. across, solitary or in few-fld clusters, Aug.–Sept. Persia to Himalayas.

ovata (*Viorna ovata*). Erect herb to 2 ft.: lvs. simple and entire: fls. bell-shaped, purple, about 1 in. long, solitary and nodding, May–June. Va. to S. C.

paniculata. Climbing to 30 ft.: lvs. of 3–5 entire or lobed lfts.: fls. white, about 1 in. across, fragrant, in many-fld. panicles, Sept.–Oct. Japan. Var. **dioscoreæfolia** (*C. dioscoreæfolia*) has heart-shaped lfts. and broader sepals.

patens. Climbing to 12 ft.: lvs. of 3–5 entire lfts.: fls. violet to white, to 6 in. across, solitary, May–June. Japan. Var. **Fortunei** (*C. Fortunei*). Fls. creamy-white turning pink, to 5 in. across. Var. **grandiflora** has larger fls. Var. **Standishii.** Fls. lilac-blue: lfts. 3.

Pitcheri: *C. Simsii.*

pubescens. Climbing: lvs. of 3 slightly toothed or entire lfts.: fls. white, in panicles. Mex.

recta (*C. erecta*). Erect or ascending herb to 3 ft.: lvs. of 5–9 entire lfts.: fls. white, to 1 in. across, fragrant, in many-fld. terminal panicles, in summer. S. Eu. Var. **mandschurica** (*C. mandschurica*) is taller with terminal and axillary panicles. Var. **plena** has double fls.

reticulata (*Viorna reticulata*). Climbing to 10 ft.: lvs. of 3–7 entire leathery reticulated lfts.: fls. urn-shaped, yellowish outside, pale violet within, about ¾ in. long, solitary and nodding, July. S. C. to Fla. and Tex.

Scottii (*Viorna Scottii*). Erect herb to 1½ ft.: lvs. bipinnate, the petioles often twisted: fls. urn-shaped, purplish-brown, to 1¼ in. long, solitary, May–July. Wyo. to New Mex.

serratifolia. Climbing to 10 ft.: lvs. biternate, the lfts. toothed or lobed: fls. yellow with purple stamens, 2 in. across, 1–3 together, Aug.–Sept. Korea.

Sieboldii: *C. florida* var.

Simsii (*Viorna Simsii. C.* and *Viorna Pitcheri*) Climbing: lvs. of 3–7 entire or lobed lfts., the terminal one sometimes a tendril: fls. urn-shaped, purplish, to 1 in. long, solitary, in summer: achenes without plumose style. Ind. to Neb. and Tex.

Spooneri: *C. chrysocoma* var. *sericea.*

stans. Erect herb to 6 ft.: lvs. of 3 large coarsely toothed or lobed lfts.: fls diœcious, tubular, white or bluish, about ½ in. long, in long terminal panicles and axillary clusters, Sept.–Oct. Japan.

tangutica. Golden C. Climbing to 10 ft.: lvs. pinnate or bipinnate, the lfts. toothed or lobed: fls. bright yellow, to 4 in. across, usually solitary, June and again in autumn. Mongolia, N. China.

texensis (*C.* and *Viorna coccinea*). Scarlet C. Climbing to 6 ft.: lvs. of 4–8 rather thick glaucous lfts.: fls. urn-shaped, scarlet, about 1 in. long, solitary and nodding, July–Sept. Tex.

versicolor (*Viorna versicolor*). Climbing to 12 ft.: lvs. pinnate, the lfts. entire, glaucous beneath: fls. urn-shaped, ¾ in. long, purplish, solitary and nodding, July. Mo., Ark.

verticillaris (*Atragene americana*). Climbing or trailing to 10 ft.: lvs. of 3 entire or coarsely toothed lfts.: fls. purple, to 4 in. across, solitary, May–June. N. Amer.

Viorna (*Viorna Viorna*). Climbing to 10 ft.: lvs. of 5–7 entire or lobed lfts.: fls. urn-shaped, reddish-purple, about 1 in. long, solitary and nodding, May–Aug. Pa. to Ga. and Ala.

virginiana. Climbing to 20 ft.: lvs. of usually 3 coarsely toothed lfts.: fls. diœcious, white, to 1 in. across, in leafy panicles, Aug.–Sept. N. S. to Ga. and Kans.

Vitalba. Travelers-Joy. Old-Mans-Beard. Climbing to 30 ft.: lvs. of 5 entire, toothed or 3-lobed lfts.: fls. greenish-white, to 1 in. across, fragrant, in panicles, July–Sept. Eu., N. Afr., S. W. Asia.

Viticella. Climbing to 12 ft.: lvs. pinnate or bipinnate, the lfts. entire or 3-lobed: fls. blue, purple or rose-purple, the stamens yellow, to 2 in. across, 1–3 together, June–Aug.: achenes without plumose styles. S. Eu., W. Asia. Var. **kermesina** has wine-red fls.

CLEMENTSIA: *Sedum rhodanthum.*

CLEOME. *Capparidaceæ.* Trop. or warm-country herbs and subshrubs with simple or palmately compound lvs., white, green, yellowish or purplish fls. solitary or in racemes, petals narrow and stamens long, the ovary long-stalked (on a gynophore), and narrow capsular frs.

One annual species is commonly cultivated as a flower-garden and border subject for its rose-purple or white flowers; it is raised from seeds sown usually where the plants are to stand.

arborea. Pubescent white-fld. shrub of Venezuela; the *arborea* of the trade is sometimes (perhaps always) *C. spinosa.*

gigantea: *C. spinosa.*

grandis: see under *C. spinosa.*

integrifolia: *C. serrulata.*

pungens: *C. spinosa.*

serrulata (*C. integrifolia*). Glabrous ann., 2–3 ft., sometimes planted, formerly as a bee-plant: lfts. 3: fls. pink or white. N. Amer.

speciosa: *Gynandropsis speciosa.*

spinosa (*C. gigantea* of the trade. *C. pungens*). Spider-Flower. Pubescent erect strong-scented ann. to 4 ft., with short strong spines on the sts. and very long stamens and stalked pods: lfts. 5–7. Trop. Amer., sometimes run wild.—Some of the stock raised as *C. gigantea* and *C. grandis* is *Polanisia trachysperma* (which see).

CLERODENDRUM (*Volkameria*). Glory-Bower. *Verbenaceæ.* Trees, shrubs or herbs with opposite or whorled simple lvs. and white, violet or red fls. in terminal cymes or panicles, the stamens long-exserted; grown in the greenhouse or out-of-doors in the S. Propagated by seeds or cuttings of half-ripened wood kept in a temperature of about 70°.

Balfouri: *C. Thomsonæ.*

fallax: *C. speciosissimum.*

Fargesii: *C. trichotomum* var.

fœtidum. Shrub to 6 ft.: lvs. broadly ovate, to 1 ft. long, coarsely toothed, reddish pubescent beneath: fls. rose-red, ¾ in. across, in a head-like cluster to 8 in. across. China, adapted only to southern parts, as Fla., Gulf Coast, Calif.

fragrans. Shrub 5 to 8 ft.: lvs. broadly ovate, to 10 in. and more long, coarsely toothed, pubescent: fls. white or pale pink, 1 in. across, in terminal clusters resembling the hydrangea, fragrant, with exserted stamens and pistils. China, Japan; adapted Fla. to Calif.—The single-fld. form is seldom seen, the common one both in cult. and run wild being var. **pleniflorum,** with double fls. in a very compact head.

glabrum. Shrub or small tree, glabrous except sometimes on veins of lvs., which are opposite or whorled, oblong-ovate, to 5 in. long, mostly pointed, entire, glossy above: fls. small, white or pinkish, fragrant, in dense broad terminal cluster. S. Afr.; adapted to S. Calif., S. Fla.

japonicum (*C. squamatum*). Shrub to 10 ft.: lvs. oval, cordate at base, entire or toothed: fls. bright scarlet, in panicles. China.

Siphonanthus: *Siphonanthus indica.*

speciosissimum (*C. fallax*). Shrub to 4 ft.: lvs. ovate, heart-shaped at base, to 1 ft. long, entire or toothed, densely pubescent: fls. bright scarlet, to 2 in. across, in panicles to 1½ ft. long. Java.

speciosum. Hybrid between *C. Thomsonæ* and *C. splendens,* having dull red fls.

splendens. Twining shrub: lvs. oblong or elliptic, to 6 in. long: fls. bright scarlet or yellow, 1 in. across, in many-fld. cymes. Trop. Afr.—Grown under glass.

squamatum: *C. japonicum.*

Thomsonæ (*C. Balfouri*). Twining evergreen shrub, favorite in greenhouses: lvs. ovate, to 5 in. long, entire: fls. crimson with large white calyx, in branching racemes. W. Afr. Var. **delectum** has very large clusters of rose-magenta fls. Var. **variegata** is a variegated form.

trichotomum. Shrub to 10 ft.: lvs. ovate, to 5 in. long, entire or toothed, pubescent: fls. white with conspicuous reddish-brown calyx, in panicles. Japan; hardy N. Var. **Fargesii** (*C. Fargesii*) has smaller nearly glabrous lvs.

CLETHRA. White-Alder. *Clethraceæ.* Shrubs or small trees with alternate simple toothed deciduous or persistent lvs. and fragrant white or pink fls. in terminal racemes or panicles in late summer. Allied to Ericaceæ; species in E. Asia, E. N. Amer., Madeira, and in tropics; most of those listed below are hardy in northern or north-central states.

Propagated by seeds sown in pans in spring, greenwood cuttings under glass, layers, and division.

acuminata. To 15 ft.: lvs. oval or oblong, to 8 in. long, acuminate: racemes nodding, usually solitary. Va. to Ga.

alnifolia. Sweet Pepperbush. Summer Sweet. To 10 ft.: lvs. obovate, to 4 in. long, obtuse or acute: racemes erect, usually panicled. Me. to Fla. Var. **rosea** has pink fls.

arborea. To 20 ft., evergreen: lvs. narrow-elliptic, to 4 in. long, acuminate, shining above: racemes panicled; fls. fragrant. Madeira; not hardy N.

barbinervis. To 30 ft.: lvs. obovate, to 5 in. long, acuminate, pubescent: racemes panicled; fls. fragrant. Japan.

tomentosa. To 8 ft.: lvs. obovate, to 4 in. long, acute or acuminate, tomentose beneath: racemes erect, solitary or few. N. C. to Fla. and Ala.

CLETHRACEÆ. White-Alder Family. Only one genus, Clethra, which is grown for ornament. Family is characterized by regular bisexual fls. having 5-parted calyx, 5 separate petals, 10 stamens, superior 3-celled ovary, and capsular frs.

CLEYERA JAPONICA: *Eurya ochnacea.*

CLIANTHUS. *Leguminosæ.* Shrubs partially trailing and often trained on rafters in greenhouses or grown out-of-doors in the S., with pinnate lvs. of many small lfts., large papilionaceous fls. in pendulous axillary racemes, the keel petal long and beak-like, and cylindrical inflated pods. Propagated by seeds and cuttings and *C. Dampieri* by grafting on roots of *Colutea arborescens.*

Dampieri. Glory-Pea. To 4 ft., grayish-pubescent: fls. scarlet with a large purplish-black blotch at base of standard, to 3 in. long: pods to 2½ in. long. Australia.

puniceus. Parrots-Bill. Parrot-Beak. Red Kowhai. To 6 ft.: fls. crimson, to 3 in. long: pods to 3 in. long. New Zeal. Var. **albus** has white fls.

CLIFF-BRAKE: *Pellæa.*

CLIFTONIA MONOPHYLLA (*C. ligustrina*). Buckwheat-Tree. Titi. *Cyrillaceæ.* An evergreen shrub or small tree, native in swamps Ga., Fla. to La., may sometimes be transplanted to grounds. It has narrow simple lvs. to 2 in. long and terminal racemes of white-blush fls. in spring, and winged fr.

CLINOPODIUM: *Satureja.*

CLINTONIA. *Liliaceæ.* Herbs spreading by long underground rhizomes, having broad basal lvs. and fls. in umbels or solitary at end of scape, the perianth-segms. distinct; native in N. Amer. and E. Asia. There is another Clintonia which is properly Downingia, comprising the species *elegans* and *pulchella.*

Clintonias should be planted in moist shady and woodsy places. Propagated by division of roots in spring; attractive for colonizing.

Andrewsiana. To 1½ ft.: fls. rose-purple, ½ in. long, in umbels: berries blue. Calif.

borealis. To 1½ ft.: fls. greenish-yellow, ¾ in. long, nodding, in 3–6-fld. umbels: berries blue. E. N. Amer.

umbellata. To 1½ ft.: fls. white often spotted with purple, ⅓ in. long, in many-fld. umbels: berries black. N. Y. to Ga. and Tenn.

CLITORIA. Butterfly-Pea. *Leguminosæ.* Per. herbs or shrubs, often climbing, with pinnate lvs., showy papilionaceous fls., solitary or in axillary racemes, and flattened pods; grown for ornament far S. and also under glass. Propagated by seeds or cuttings under glass.

cajanifolia. Herb to 2 ft.: lfts. 3, gray-pubescent beneath: fls. pale violet, to 1½ in. long: pods to 2½ in. long. Trop. Amer., trop. Asia.—Grown as a cover-crop in the tropics.

mariana. To 3 ft., often twining: lfts. 3: fls. light blue, 2 in. long, June–July: pods to 2 in. long. N. J. to Fla. and Tex.

ternatea. Slender twiner: lfts. 5–7: fls. bright dark blue with lighter markings, 2 in. long: pods to 4½ in. long. Spread in the tropics, probably Asian.—An attractive climber, hardy only in southern parts. Fls. sometimes more or less double.

CLIVIA. Kafir-Lily. *Amaryllidaceæ.* S. African herbs with fleshy roots, the expanded lf.-bases forming bulb-like parts, narrow evergreen lvs., and showy reddish-yellow or scarlet fls. in terminal umbels, the perianth-tube short.

Clivias are good greenhouse or house subjects. Well-grown plants should be kept in the same pots for several years, giving applications of liquid manure. Water should be practically withheld during resting period. In subtropics they are grown in shady places. Propagated by division.

cyrtanthiflora (*Imantophyllum cyrtanthiflorum*). Hybrid between *C. miniata* and *C. nobilis.*

miniata (*Imantophyllum miniatum*). Lvs. to 1½ ft. long and 2 in. wide, thick and glossy: fls. erect, scarlet, yellow inside, to 3 in. long: berries bright red, 1 in. long.—The usual species in cult.

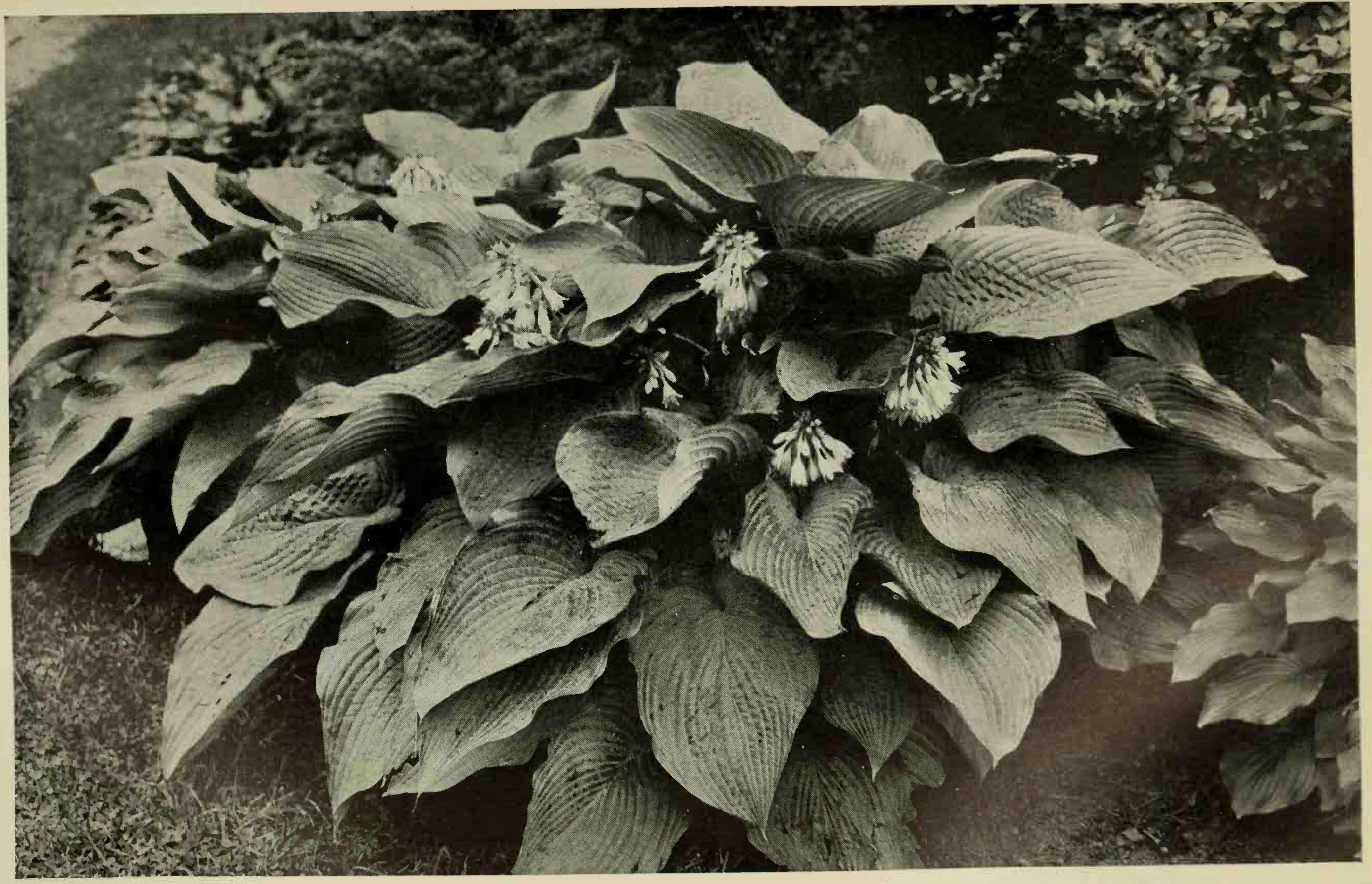
nobilis. Fls. many, drooping, narrower and shorter than in *C. miniata*, red and yellow and tipped green.

CLOCK-VINE: *Thunbergia.*

CLON. A variety or group or variation propagated only by asexual or vegetative parts. Such races do not "come true" from seeds. The horticultural varieties of roses, apples, oranges, strawberries, carnations are clons, also the cultivated forms of day-lilies and plantain-lilies that do not produce seeds. Clon is a horticultural rather than taxonomic term.

CLOUDBERRY: *Rubus Chamæmorus.*

CLOVER. Species of Trifolium. The clovers are primarily hardy forage and meadow plants and do not come within the range of this Hortus. Many of the species are interesting and showy in the garden, as for example *Trifolium rubens, T. incarnatum, T. alpestre, T. hybridum;* some of the small kinds are useful in the rock-garden. Clovers are best propagated by seeds; some of them are annuals but even the perennials are likely to be short-lived. *T. repens* may be increased by the rooting runners, but as a constituent of lawns it is started from seeds. See *Trifolium.*



V. A PLANTAIN-LILY. — *Hosta Sieboldiana*, a hardy perennial with heavy glaucous-green foliage, and nearly white flowers in late spring or early summer

CLOVER: *Trifolium, Medicago.* **Bokhara:** *Melilotus alba.* **Bur:** *Medicago.* **Bush:** *Lespedeza.* **Holy:** *Onobrychis viciæfolia.* **Hubam:** *Melilotus alba* var. *annua.* **Japan:** *Lespedeza striata.* **Mexican:** *Richardia scabra.* **Musk-:** *Erodium moschatum.* **Owls:** *Orthocarpus.* **Prairie:** *Petalostemum.* **Sweet:** *Melilotus.* **Tick:** *Desmodium.*

CLOVE-TREE: *Eugenia aromatica.*

CLUB-MOSS: *Lycopodium.*

CLUSIACEÆ: see *Guttiferæ.*

CLYTOSTOMA. *Bignoniaceæ.* Evergreen climbing shrubs with lvs. of 2 entire lfts. and a terminal tendril (or simple on blooming twigs), large attractive funnelform fls. in panicles, and prickly capsular frs.; native in S. Amer.

Clytostomas are grown under glass in the North and in the open in warm regions. They thrive in fertile soil. Propagated by cuttings.

callistegioides (*Bignonia speciosa*). Lfts. oval-oblong, to 3 in. long, wavy-margined: fls. lavender and streaked, to 3 in. long and 3 in. across. Brazil, Argentina.

purpureum (*Bignonia purpurea*). Lfts. ovate-oblong, to 3 in. long, usually entire: fls. mauve with white throat, 1 in. long. Uruguay.

CNEORIDIUM. *Rutaceæ.* Stiff-twiggy evergreen shrub 2–4 ft. high, on hills in S. Calif., with abundant very fragrant pedicelled fls. in upper axils or in very short clusters, nearly white inside and pinkish outside: lvs. linear, about 1 in. long, obtuse, dotted: fr. globose, drupe-like, reddish-brown, about ¼ in. diam. C. **dumosum** is the only species; adapted to cult. in its region.

CNEORUM, the only genus of *Cneoraceæ.* Shrubs with alternate leathery entire lvs. and solitary or cymose fls. having 3–4 sepals, petals and stamens, and fr. a 3-parted drupe; native in the Medit. region and Canary Isls.; to be grown in mild climates.

tricoccon. SPURGE-OLIVE. Evergreen, to 4 ft., glabrous: lvs. oblong, to 2 in. long, shining: fls. deep yellow, 1–3 in the axils: fr. greenish-black. S. Eu.

CNICUS. BLESSED THISTLE. *Compositæ.* One branching thistle-like ann. in the Medit. region and Caucasus, suitable for rock- and wild-gardens. Easily grown from seed. C. **benedictus** (*Carduus benedictus. Centaurea benedicta*). To 2 ft.: lvs. oblong, pinnately cut and toothed, spiny: heads yellow, 1 in. across, terminal, surrounded by leafy bristly bracts. See *Cirsium* and *Carlina* for other species advertised as Cnicus.

CNIDOSCOLUS: *Jatropha texana.*

COACH-WHIP: *Fouquieria splendens.*

COAT-FLOWER: *Tunica Saxifraga.*

COBÆA (*Rosenbergia*). *Polemoniaceæ.* Trop. American climbing shrubs with pinnately compound lvs. terminating in a branched tendril and bell-shaped violet or bright green fls. solitary in the axils, the calyx large, inflated and leaf-like; grown under glass and in the open. Treated as annuals. Propagated by seeds.

macrostoma. Climbing to 10 ft.: lvs. of 6 obovate lfts.: fls. yellowish-green, on long stalks. Guatemala.

scandens. Climbing to 25 ft.: lvs. of 4–6 oval or oblong lfts.: fls. violet or greenish-purple, 2 in. long and 1½ in. across, on very long stalks. Mex. Var. **alba** has white fls. and **purpurea** deeper purple.

COBNUT: *Corylus Avellana* var. *grandis.*

COCA: *Erythroxylon Coca.*

COCAINE-PLANT: *Erythroxylon Coca.*

COCCINIA (*Cephalandra*). *Cucurbitaceæ.* Slender tendril-bearing vines from the Asian and African tropics, perhaps a score of species, one of which is rarely seen under glass and is somewhat run wild in trop. Amer.: lvs. angled or lobed: plants mostly diœcious, the pistillate fls. solitary and staminate solitary or racemose: fr. roundish to oblong and somewhat berry-like, small, indehiscent.

cordifolia (*C. indica*). IVY GOURD. Climbing or prostrate, to 6 ft. or more, smooth, root per.: lvs. broadly triangular-ovate and angled, 2–4 in. across: fls. white, bell-shaped, corolla about 1½ in. long with sharp lobes: fr. ovoid or oblong, smooth, scarlet. Asia, Afr.

indica: *C. cordifolia.*

COCCOCYPSELUM (*Tontanea*). *Rubiaceæ.* Prostrate herbs of trop. Amer. with opposite simple lvs. and funnelform fls. in heads; one suitable for ground-cover or basket-plant.

guianense. Lvs. ovate, to 2½ in. long, hairy: fls. purplish, small: fr. a blue berry about ¾ in. long. Trinidad, N. S. Amer.

COCCOLOBIS (sometimes spelled *Coccoloba*). *Polygonaceæ.* Trop. and subtrop. American trees and shrubs with alternate entire often very large lvs., greenish fls. in racemes or spikes and fleshy berry-like frs.

Grown out-of-doors in warm and frostless climates, and under glass northward. They do best in rich sandy soil. Propagated by seeds, cuttings of ripe wood and layering.

floridana (*C. laurifolia*). PIGEON-PLUM. Small tree near coast in S. Fla.: lvs. oblong, entire, 2–4 in. long: racemes short bearing edible pear-shaped fr. about ½ in. long.

grandifolia (*C. pubescens*). Tree to 80 ft.: lvs. orbicular, to 3 ft. across, rusty-pubescent below and with prominent veins: fls. greenish, in erect terminal racemes to 2 ft. long.—Grown in its juvenile stage as a pot-plant for the great ornamental lvs.

laurifolia: *C. floridana.*

pubescens: *C. grandifolia.*

uvifera. SEA-GRAPE. Tree to 20 ft. or more: lvs. orbicular, to 8 in. across, cordate at base, leathery, glossy and veined red: fls. white, in dense racemes to 10 in. long: frs. purple, resembling bunches of grapes, used for jelly. A characteristic native tree on coasts from S. Fla. southward.

COCCOTHRINAX. *Palmaceæ.* Ten or a dozen small or slender unarmed hermaphrodite fan-palms of Fla., W. Indies, Cent. Amer., distinguished from Thrinax by the spadix mostly shorter than petioles (and often curling or incurving with age), stamens mostly 9–12, fr. dark colored inside and out, berry-like, albumen ruminate and outside of seed furrowed to correspond, and usually more pliable lvs. with more drooping segms. See *Palm.*

argentea (*Thrinax argentea. Thrincoma alta*). Variable palm, known under several Latin names, to 30 ft. high but sometimes almost stemless: lvs. nearly orbicular, 2–3 ft. across, shining green above and silvery-white underneath, cleft beyond middle into about 60 rather narrow segms.: spadix commonly shorter than petioles; stamens mostly 9: fr. globose, about ⅜ in. diam., and seed about ¼ in. Bahamas to Trinidad; in S. Fla.—*C. jucunda* is probably not separable, and in the northern limits of its range, as about Miami, it is very low or almost stemless (*C. Garberi*). The palm sometimes planted as *Thrinax altissima* may belong here. An attractive palm.

barbadensis (*Thrinax barbadensis*). Large palm, for the genus, with straight trunk to 40 or 50 ft.: lvs. relatively large, green on both sides but with slight silvery down beneath, deeply cut into 30 or more segms. which are 2 in. or so broad: spadix long, to 18 or 20 in.; stamens 12: fr. spherical, nearly ½ in. diam.; seed about ¼ in. diam. Lesser Antilles.

Garberi: *C. argentea.*

jucunda: *C. argentea.*

Miraguano. Slender palm to 20 ft., with small head, the trunk soon becoming bare: lvs. stiff, silvery-white underneath, the 20–30 deep segms. of the orbicular blade very stiff, base of petiole fibrous-reticulate: fls. small, pedicelled. Plains and hillsides, Cuba.

COCCULUS (*Cebatha. Epibaterium*). Snailseed. *Menispermaceæ.* Shrubs, erect or twining, with alternate, entire or lobed lvs., small unshowy unisexual fls. in racemes or panicles, and drupaceous frs.; of wide distribution. Easily cult. in moist soil. Propagated by seeds or cuttings of half-ripened wood under glass.

carolinus. Carolina Moonseed. Twining: lvs. ovate, to 4 in. long, entire or 3–5-lobed, pubescent beneath: panicles to 5 in. long: fr. red. Va. to Fla. and Tex.; hardy well N.

laurifolius. Evergreen shrub to 15 ft.: lvs. oblong, to 6 in. long, leathery and shining: panicles to 2 in. long: fr. black. Himalayas; adaptable only in warm climates.

trilobus. Twining: lvs. ovate, to 3½ in. long, entire or 3-lobed, pubescent on both sides: fls. in axillary cymes: fr. black. Japan, China, Philippines; hardy N.

COCHEMIEA. *Cactaceæ.* A few small cylindric tubercled cacti of Lower Calif. with tubular slender scarlet fls. bearing petal-like sepals, formerly included in Mammillaria and treated the same under cult. See *Cacti.*

Halei (*Mammillaria Halei*). Cespitose, sts. nearly upright to 20 in., densely covered with spines, tubercles short with woolly axils, radials 10–20, centrals 3 or 4: fls. to 2 in. long.

Poselgeri (*Mammillaria Poselgeri* and *M. Roseana*). Sts. numerous, sometimes creeping or hanging, often 6 ft. long and 1½ in. thick, tubercles far apart and somewhat flattened, radials 7–9, central 1 and hooked: fls. about 1¼ in. long.

setispina (*Mammillaria setispina*). Sts. ascending, to 1 ft. high, axils woolly; radials 10–12 and white with black tips, centrals 1–4: fls. not described.

COCHINEAL PLANT: *Nopalea cochenillifera.*

COCHLEARIA. Scurvy-Grass. *Cruciferæ.* One little bien. or per., C. officinalis, of high northern regions, is a medicinal plant, and has been grown as a salad plant but the tarry flavor is against it for most persons. For salad, it is grown as an ann., lvs. being ready two to three months after sowing; succession sowings may be made. The plant prefers a cool position, or one partially shaded. It grows 1 ft. high, less or more, when in bloom; the early basal lvs. are heart-shaped or kidney-shaped; fls. small, white, in spring; pod or silicle ¼ in. or less long. Other species of Cochlearia inhabit the colder parts of north temp. zone but are not cult. For *C. saxatilis* see *Kernera.*

COCHLOSPERMACEÆ. Cochlospermum Family. Two genera of woody plants native in trop. regions, separated from Bixaceæ on technical characters of fls. and capsules. Cochlospermum is treated below.

COCHLOSPERMUM (*Maximilianea*). *Cochlospermaceæ.* Trop. trees or shrubs with palmately lobed or divided lvs., fls. in racemes or panicles appearing at end of dry season before the lvs., and capsular fr.; one species grown in tropics and intro. in S. Calif.

vitifolium. Tree to 40 ft.: lvs. alternate, deeply 5-lobed, to 1 ft. across, the lobes toothed: fls. bright yellow, 4 in. and more across, in terminal clusters, with numerous stamens: caps. to 3 in. long, velvety-pubescent. Mex., Cent. and S. Amer.

COCKSCOMB: *Celosia argentea* var. *cristata.*

COCKS-EGGS: *Salpichroa rhomboidea.*

COCKS-FOOT: *Dactylis glomerata.*

COCONUT. The fruit of *Cocos nucifera*, a widespread palm. The products of the coconut tree are mainly four: toddy or beverage derived from the sap obtained from incising the flower-clusters and which may also be a source of sugar; coir, the fiber from the husk of the nut, much used in cordage and in the making of brushes and mats and otherwise; copra, the dried meat of the nut, employed in the making of oil; the mature edible nut itself.

Coconuts thrive in the tropics, but not necessarily on the seacoast, and grow well in southern Florida but the nuts are there less an article of commerce than for propagating purposes; that is, in Florida they are planted for ornament and home use. The tree is grown only from seeds, which are ordinarily planted in a shaded seed-bed with the nut not completely covered and preferably once or more transplanted before being set in permanent place. When only a few trees are desired, the nut may be planted where the plant is to grow if quick effects are not desired. For fruit-bearing, the trees are planted when perhaps three or four years old. About 25 feet apart each way is a good spacing for a commercial grove. Ordinarily coconuts receive little attention in tillage or fertilizing but they respond to good treatment as well as other plants. A few fruits may be borne in four or five years but no important yield is to be expected before about ten years. Beyond twenty years the grove should be in full bearing. A good tree on fertile ground should yield 75 or more nuts a year, but the average is probably not more than one-third of this number. There are many varieties of coconuts; and in any case the grower should choose nuts from trees producing abundantly of choice fruits if he expects the best product.

COCONUT, DOUBLE: *Lodoicea.*

COCOS. *Palmaceæ.* As now defined, a monotypic genus including only the coconut, C. nucifera, the nativity of which is in doubt but by most authorities considered to be of Asiatic or Polynesian origin. Ubiquitous practically unarmed tree in trop. littorals, reaching 60–80 ft. or more, with a more or less crooked or inclined trunk, the spadices from the lower axils of the crown; spathe striate on the outside but not plicate-sulcate: lvs. pinnate, to 15 or more ft. long; pinnæ many, linear-lanceolate and long-pointed, of firm texture: staminate fls. numerous and borne on the upper part of the branches of the spadix, the few large pistillate fls. near the base; stamens 6; sepals and petals of pistillate fls. convolute-imbricate: fr. very large, 1-seeded, with an interior cavity containing nutrient liquid. An abundant tree in southern part of peninsular Fla., apparently spontaneous on some of the Keys. See *Coconut.*

The breaking up of the old genus Cocos places the kinds planted in the U. S. or in our literature under the following genera: Arecastrum, Arikuryroba, Butia, Rhyticocos, Syagrus. Following are the Cocos names likely to be met in lists:

Alphonsei: unrecognized name.

amara: *Rhyticocos amara.*

Arechavaletana: *Arecastrum Romanzoffianum* var. *australe.*

argentea: *Syagrus argentea*, apparently not cult., and probably the hort. name belongs with another palm.

australis: *Butia capitata*; of botanists, *Arecastrum Romanzoffianum* var. *australe.*

Blumenavia: see *Butia eriospatha.*

Bonneti: *Butia Bonneti.*

botryophora: *Arecastrum Romanzoffianum* var. *botryophorum.*

braziliensis: unidentified name.

campestris: *Syagrus campestris*, probably not in cult. here, but the name has been attached to a Butia.

capitata: *Butia capitata.*

comosa: *Syagrus comosa*, apparently not in cult., but name has been associated with a Butia.

coronata: see *Butia capitata.*

Datil: *Arecastrum Romanzoffianum* var. *australe.*

eriospatha: *Butia eriospatha.*

flexuosa: *Arecastrum Romanzoffianum* var. *australe*; of botanists, a Syagrus apparently not in cult.

Gaertneri: *Butia Bonneti.*

humilis: unidentified name; has been applied to a Butia.

insignis: *Syagrus insignis.*

lapidea: confused name; has been attached to a Butia.

littoralis: unidentified name; has been used for a Butia.

macrocarpa: *Syagrus macrocarpa.*

Mariæ-Reginæ: unidentified name.

maritima: unidentified name.

Maximiliana: probably a Syagrus.

Nehrlingiana: *Butia Nehrlingiana.*

Normanbyi: *Normanbya Normanbyi.*

odorata: *Butia capitata* var. *odorata.*

paraguayensis: *Butia Yatay* var.

petræa: *Syagrus petræa.*

plumosa: *Arecastrum Romanzoffianum.*

Procopiana: *Syagrus macrocarpa.*

pulposa: *Butia capitata* var. *pulposa.*

Romanzoffiana: *Arecastrum Romanzoffianum.*

rupestris: *Syagrus petræa.*

sapida: *Syagrus sapida*, probably not grown here; the hort. name may mean *Rhopalostylis sapida.*

schizophylla: *Arikuryroba schizophylla.*

vinifera: applied to an undetermined Butia.

Weddelliana: *Syagrus Weddelliana.*

Yatay: *Butia Yatay.*

Yurumaguas: see *Butia Yatay* var. *paraguayensis.*

CODARIOCALYX: *Desmodium gyrans.*

CODIÆUM (*Phyllaurea*). CROTON (of florists). *Euphorbiaceæ.* Shrubs from the Old World tropics with thick alternate simple or lobed lvs., small monœcious fls. in axillary racemes, and capsular fr.; extensively grown in southern regions and under glass for the colored ornamental foliage, exceedingly variable.

Any good soil is suitable for crotons. They develop better coloring if planted in sunny situations. Propagated by seeds, but named sorts should be increased by cuttings of half-ripened wood over bottom heat. Separate plants may be produced from large branches by air-layering; a cut is made in the stem below the leaves and tied with moss; roots will form in about three weeks and the part may be cut and potted as an independent plant.

variegatum var. **pictum**. To 6 ft. and more: lvs. ovate-lanceolate to linear, entire or lobed, sometimes cut almost to midrib, variously marked with white, yellow or red: fls. white.—Runs into numerous named forms of which the following are the best known: **amabile** with bright-colored lanceolate lvs.; **anatomense** with narrow lvs.; **Andreanum** with broad yellow lvs.; **aucubæfolium** with broad yellow red-blotched lvs.; **aureo-maculatum** with green lvs. spotted yellow; **Bergmanii** with broad cream-yellow lvs. blotched with green; **brilliantissimum** with narrow lvs.; **bruxellense** with broad lvs.; **Chantrieri** with narrow red lvs.; **Chelsoni** with yellow red-mottled lvs.; **Childsoni** with narrow lvs.; **cornutum** with mottled yellow lvs. and projecting midribs; **Craigii** with 3-lobed lvs.; **Cronstædii** with spirally twisted lvs. variegated yellow; **Davisii** with narrow lvs. variegated white; **edmontense** with narrow bright-colored lvs.; **elegantissimum** with narrow yellow dotted lvs. and red petiole; **Evansianum** with 3-lobed yellow lvs. veined and mottled with red; **fasciatum** with broad lvs. veined yellow; **filifolium aureum** with narrow lvs.; **Hammondii** with narrow lvs.; **Hanburyanum** with narrow yellow lvs. marked with rose; **illustre** with 3-lobed lvs. variegated with yellow; **inimitable**, lvs. yellow veined with red; **interruptum**, lvs. yellow with red midrib, sometimes twisted; **irregulare** with irregular lvs. and yellow spots and midrib; **Jamesii** with broad lvs. irregularly blotched with yellow or white; **macrophyllum** with large lvs.; **montefontainense** with slightly 3-lobed red lvs. veined with yellow; **Mortii**, lvs. broad, green and yellow; **musaicum** with yellow and green lvs.; **Newmannii** with broad dark crimson lvs.; **nobile** with linear yellow lvs. variegated with red; **picturatum** with richly colored lvs.; **Pucciana** with broad lvs.; **punctatum aureum** with narrow lvs.; **Reidii**, lvs. yellow variegated with red; **roseo-pictum**, lvs. variegated with yellow and red; **ruberrimum**, linear crimson lvs. marked with creamy white; **rubro-lineatum** with yellow lvs. shaded with crimson; **Sanderi** with broad irregularly blotched lvs. **Schattii** with broad lvs.; **Sinitzianum** with narrow lvs. spotted with yellow or white; **superbum**, narrow lvs. mottled green and yellow; **Thomsonii**, lvs. prominently yellow marked; **tortile** with spirally twisted lvs. variegated with red; **trilobum** with 3-lobed yellow blotched lvs.; **undulatum**, broad wavy lvs. veined with red or purple; **variabilis** with narrow lvs.; **Veitchii** with broad lvs. variegated with red; **volutum** with narrow lvs.; **Warrenii**, lvs. yellow variegated with red; **Weismanii** with narrow wavy-margined lvs. variegated with yellow and with red petiole.

CODONOPSIS. *Campanulaceæ.* Asian per. herbs, upright or climbing, with mostly alternate lvs., 5-lobed bell-shaped fls., and capsular frs.; the first species sometimes grown in the rock-garden, and requires winter protection in the N.

clematidea (*Glosocomia clematidea*). To 3 ft.: lvs. ovate: fls. white tinged with blue. Mts. of Asia.

ovata. To 1 ft., sts. decumbent: lvs. ovate, to ¾ in. long: fls. pale blue spotted inside, to 1¼ in. long, solitary and terminal. Himalayas.

silvestris. Climbing: lvs. ovate, wavy-toothed, glaucous beneath: fls. pale yellowish-purple, solitary. Manchuria.

viridiflora. Climbing: lvs. ovate, wavy-toothed: fls. greenish-yellow. W. China.

CŒLIA. *Orchidaceæ.* Epiphytes native in Cent. Amer. and W. Indies having pseudobulbs bearing 2–4 lvs. and fls. in dense racemes, the column produced into a foot to which the lateral sepals are attached at base. For cult. see *Orchids.*

Baueriana: *C. triptera.*

macrostachya. Lvs. lanceolate, to 14 in. long: fls. rose, on scapes as long as lvs., the lip with 2 small sacs below, Aug.–Sept. Mex.

triptera (*C. Baueriana*). Lvs. broad-linear, 4 in. and more long: fls. white, on scapes as long as lvs., the ovary sharply winged, Feb.–Apr. Mex., W. Indies.

CŒLOGLOSSUM: *Habenaria bracteata.*

CŒLOGYNE. *Orchidaceæ.* Epiphytes from the eastern hemisphere having pseudobulbs bearing 1–2 lvs. and showy fls. in racemes, the sepals and petals similar, the lip 3-lobed and keeled; grown under glass, often suspended, mostly in intermediate temperatures. See *Orchids.*

asperata. Lvs. to 2½ ft. long and 5 in. wide: fls. white, fragrant, 3 in. across, in many-fld. drooping racemes to 16 in. long, the lip marked with yellow-brown and wavy at margins, Apr.–July. E. Indies, Philippine Isls.

barbata. Lvs. to 16 in. long and 2 in. wide: fls. white, in a dense raceme longer than lvs., with brown fringed lip, Oct.–Dec. Himalayas.

corrugata: *C. nervosa.*

cristata. Lvs. to 1 ft. long and 1 in. wide: fls. in drooping racemes, snow-white with 5 yellow keels on lip, Jan.–Apr. Himalayas. Var. **hololeuca** (var. *alba*) has white keels. Var. **Lemoniana** has keels fringed with citron-yellow. Var. **maxima** has very large fls.

Dayana. Lvs. to 20 in. long and 4 in. wide: fls. to 2½ in. across, in drooping racemes to 3 ft. long, cream-white, with the lip chocolate-brown inside and with 6 white keels, Apr.–June. Malaya.

elata. Lvs. to 1 ft. long and 2½ in. wide: fls. in 4–10-fld. racemes on scapes to 20 in. long, pure white with orange-red spot on lip and 2 yellow keels, Apr.–June. Himalayas.

fimbriata. Lvs. to 5 in. long and ¾ in. wide: fls. in 1–2-fld. racemes, greenish-yellow with lip marked with brown and fringed, Aug.–Oct. China.

flaccida. Lvs. to 1 ft. long and 1 in. wide: fls. in 7–12-fld. racemes to 10 in. long, white with lip yellow in middle and with 3 orange-brown keels, Mar.–Apr. Himalayas.

fuliginosa. Lvs. to 6 in. long and 1 in. wide: fls. in 2–3-fld. racemes shorter than lvs., brownish-yellow with fringed lip spotted with brown, Nov.–Dec. Himalayas.

Huettneriana. Lvs. to 1 ft. long and 2 in. wide: fls. in 2–5-fld. racemes, white with lip citron-yellow at base, Apr.–June. Burma. Var. **lactea** (*C. lactea*) has white lip.

lactea: *C. Huettneriana* var.

Lawrenceana. Lvs. to 10 in. long, and 1 in. wide: fls. in 1–3-fld. racemes to 10 in. long, large, brownish-white, the lip with brownish side lobes and middle lobe with large brown spot and yellow spot at base, Mar.–Apr. Cochin-China.

lentiginosa. Lvs. to 7 in. long and 1½ in. wide: fls. in 4–6-fld. racemes to 4 in. long, bright straw-yellow with side lobes of lip edged with brown and middle lobe spotted with orange-yellow, Mar.–May. Burma.

Massangeana. Lvs. to 20 in. long and 5 in. wide: fls. in many-fld. drooping racemes to 2 ft. long, cream-white with lip marked with yellow and brown and white keels, June–July. Malaya.

Mayeri. Lvs. to 8 in. long and 1 in. wide: fls. in 3–5-fld. racemes to 6 in. long, green with lip marked with dark brown, Aug.–Sept. Singapore.

Mooreana. Lvs. to 20 in. long and 1½ in. wide: fls. in 3–8-fld. racemes to 16 in long, snow-white with lip spotted with golden-yellow, Apr.–May. Cochin-China.

nervosa (*C. corrugata*). Lvs. to 6 in. long and 1 in. wide: fls. in 7–12-fld. racemes, white with lip marked yellow, July–Sept. India.

nitida (*C. ocellata*). Lvs. to 6 in. long and 1 in. wide: fls. in 3–5-fld. racemes, white with golden-yellow spots on lip, Feb.–Mar. Himalayas. Var. **maxima** has larger fls.

ocellata: *C. nitida.*

pandurata. Lvs. to 14 in. long and 2½ in. wide: fls. in 3–8-fld. arching racemes to 8 in. long, green with warty lip marked with dark brown, Aug.–Oct. Borneo.

prolifera. Lvs. to 7 in. long: fls. in many-fld. racemes, greenish-yellow. Himalayas.

Sanderiana. Lvs. to 14 in. long and 2½ in. wide: fls. in 5–9-fld. racemes to 1 ft. long, white with side lobes of lip marked with brown, the middle lobe yellow with 5 yellow keels, Apr.–May. India.

sparsa. Lvs. to 4 in. long and 1½ in. wide: fls. in 3–5-fld. arching racemes to 3 in. long, white with side lobes of lip brown and 3 yellow keels, June–July. Philippine Isls.

speciosa. Lvs. to 10 in. long and 2½ in. wide: fls. in 2–3-fld. racemes, greenish-yellow, the lip brown inside with 2 long brown ridges, Apr.–July. Malaya.

tomentosa. Lvs. to 14 in. long and 3 in. wide: fls. in pendulous racemes to 20 in. long, yellow with side lobes of lip edged with brown and yellow keels, Apr.–May. Malaya.

COFFEA. Coffee. *Rubiaceæ.* Evergreen shrubs and trees with usually opposite lvs., cream or white salverform fls. in axillary clusters, and a small 2-seeded colored berry; native in Asia and trop. Afr. and widely grown in the tropics for the coffee "beans" which are really the seeds within the pulpy fr.

In the United States coffee is grown only occasionally as an ornamental subject and for its general interest, and is sometimes seen under glass. Propagated by cuttings of ripe wood, and in the tropics by seeds from which the pulp is removed.

arabica. Common or Arabian C. Shrub to 15 ft.: lvs. oval, to 6 in. long, shining dark green: fls. pure white, fragrant, 5-lobed, ¾ in. long: fr. red, ½ in. long. Trop. Afr.

liberica. Liberian C. Shrub: lvs. obovate, to 1 ft. long, shining: fls. 6–7-lobed, 1 in. long: fr. black, ¾ in. long. Trop. Afr.

Zanguebariæ. Zanzibar C. Tree to 6 ft.: lvs. oval or obovate, to 4 in. long: fls. 6–7-lobed: fr. red turning black, ½ in. long, nerved longitudinally. Trop. Afr.

COFFEE: *Coffea.* **-Berry:** *Rhamnus californica.* **Tree, Kentucky:** *Gymnocladus dioica.* **Wild-:** *Psychotria.*

COGSWELLIA: *Lomatium.*

COHERENT: two or more similar parts or organs joined.

COHOSH: *Actæa.* **Black:** *Cimicifuga racemosa.* **Blue:** *Caulophyllum thalictroides.*

COIR: see *Coconut.*

COIX. *Gramineæ.* Tall grasses with broad lvs., grown for the peculiar bead-like involucre which contains the pistillate spikelets, the staminate spikelets deciduous and borne on the axis projecting from the bead; source of a cereal food (adlay) in Asia. See *Grasses.*

Lacryma-Jobi. Jobs-Tears. Per. but grown as an ann. and not winter-hardy in cold countries, to 4 ft.: lvs. to 2 ft. long and 1½ in. wide: beads from pearly white to lead color, to 1½ in. across, hard and shining. Trop. Asia, but nat. elsewhere. Var. **aurea zebrina** has lvs. striped yellow.

COLA. *Sterculiaceæ.* Trop. African trees with alternate entire or lobed lvs., unisexual or polygamous fls. without petals borne in axillary panicles, and fr. of 4–5 leathery or woody carpels; grown in the tropics for the kernel of the fr. which is used in making drinks and in medicine.

Colas do best on sandy loam soil. Propagated by seeds, preferably singly in pots and then set out permanently, as they do not transplant well; also by cuttings of mature wood over heat.

acuminata. Cola or Goora Nut. To 40 ft. evergreen: lvs. entire, obovate, to 8 in. long, leathery: fls. yellow: fr. to 6 in. long.

COLCHICUM. Autumn-Crocus. *Liliaceæ.* Mostly autumn-blooming cormous herbs with broad basal lvs. the following spring, and very long-tubed purple or white fls. arising from the ground without sts.

Adapted to the sunny border and a loamy soil. Bulbs should be planted 2–3 inches deep in August or September, and not lifted until they show signs of deterioration. Propagated by separation of bulbs and by seeds.

autumnale. To 4 in.: lvs. to 2 in. wide: fls. purple or white, sometimes double, to 4 in. across, in autumn. Eu., N. Afr. Var. **album** has white fls., **atropurpureum** purple. Var. **major** is more robust.

Bornmuelleri. To 8 in.: lvs. to 2 in. wide: fls. rose or lilac turning purple, the tube white, 5 in. across, in autumn. Asia Minor.

byzantinum. To 6 in.: lvs. to 4 in. wide: fls. lilac-purple, to 4 in. across, many from a spathe, in autumn. S. E. Eu.

giganteum: hort. form with pink fls.

speciosum. To 1 ft.: lvs. to 4 in. wide: fls. violet with white throat or pink, to 6 in. across, in autumn. Caucasus. Var. **album** has white fls. Var. **illyricum** is listed.

variegatum. To 3 in.: lvs. 1 in. wide: fls. rose with white tube, checkered, to 4 in. across, in autumn. Greece, Asia Minor.

COLE, COLEWORT. A general name for what may be called the true Brassicas as distinguished from the mustards. The term covers the blue-leaved species, mostly biennial, as the cabbage tribe, kohlrabi, rutabaga, rape.

COLEONEMA. *Rutaceæ.* S. African shrubs with scattered linear lvs., fls. solitary in the axils, and capsular frs.; two species sometimes planted in warm climates and grown under glass in pots. For cult. see *Diosma.*

album (*Diosma alba*). To 1 ft. or more, much branched: lvs. ½ in. long: fls. white, about ⅛ in. across.

pulchrum. Taller than *C. album*, with longer lvs. and larger red fls.

COLEOSANTHUS: *Brickellia.*

COLEUS. *Labiatæ.* Ann. or per. showy-lvd. herbs grown in the window-garden, greenhouse, porch boxes, and to some extent for bedding-out: lvs. toothed: fls. small or medium-sized, usually blue or lilac, in terminal spike-like racemes; native in tropics of Old World.

Coleus is very easily propagated from short cuttings taken at any time; seeds produce many interesting variations. New plants from cuttings every year give best results.

amboinicus (*C. aromaticus*). Per. to 3 ft., hairy-pubescent: lvs. broad-ovate, to 2 in. long, coarsely round-toothed, fleshy: fls. pale purplish. India, E. Indies.—Cult. in trop. Amer. and shoots sometimes seen in market as "Spanish thyme"; aromatic.

aromaticus: *C. amboinicus.*

Blumei. The common cult. coleus, in many forms: per. to 3 ft., erect: lvs. ovate, acuminate or pointed, obtusely toothed, 4 in. or more long, variously colored with yellow, dull red and purplish, sometimes deeply cut: fls. dark blue or whitish, the whorls nearly sessile in the spike. Java. Var. **Verschaffeltii** is more branching and brilliantly colored.

lanuginosus. Herb, the root bearing tubers: lvs. ovate, to 3 in. long, densely pubescent: fls. in short-stalked clusters in long loose panicles. Cent. Afr.

ornatus: hort. name for a large-lvd. form of *C. Blumei.*

Persoonii. Erect herb: lvs. ovate, wrinkled and soft-pubescent, in many-fld. nearly sessile clusters. Madagascar.

pumilus. Sts. lax, more or less decumbent and rooting at lower joints: lvs. small, mostly 2 in. or less long, broad and obtuse, coarsely toothed, sometimes lighter colored along rib and nerves: fls. small, in long racemes. Philippines; sometimes cult., and somewhat escaped in S. Fla.

shirensis. Per. to 3 ft.: lvs. ovate, to 3 in. long, deeply toothed, pubescent beneath: fls. dark blue, in stalked clusters in large erect terminal panicles. Cent. Afr.

thyrsoideus. Bush C. Shrub to 3 ft.: lvs. cordate-ovate, to 7 in. long: fls. bright blue, the clusters in the spike-like racemes long-stalked. Cent. Afr.

COLEWORT: see *Cole.*

COLIC-ROOT: *Dioscorea villosa.*

COLLARD, COLLARDS. A large kale, *Brassica oleracea* var. *acephala*, grown in the South for greens. It is biennial or potentially perennial, producing a hard stock 1–2 feet high and bearing a loose crown of cabbage-like leaves which are eaten. Sometimes collards are grown as a winter annual for spring use; and sometimes the leaves are taken as needed and the plant allowed to stand for a year or more, where winters are very mild. The usual procedure is to sow seeds in spring in a seed-bed, transplant to 3 or 4 feet apart in the field, till through the season, and harvest the crop in autumn; the plant endures hot weather better than cabbage. If seed is wanted, the stocks may be allowed to stand where climate permits, or they may be stored for the winter and planted out the next year as are cabbage stumps.

Sometimes young cabbage plants, or related things, are erroneously called collards when used for greens.

COLLETIA. *Rhamnaceæ.* Spiny stiff S. American shrubs with thickened often flattened branchlets, the lvs. very small or usually wanting, yellowish or white fls., and fr. a leathery 3-lobed caps.; grown out-of-doors in warm regions or under glass as a curiosity. Propagated by seeds or cuttings of half-ripened wood.

armata. Branches and spines usually pubescent, spines straight or slightly curved, to ¾ in. long, lvs. small: fls. Sept.–Dec. Chile.

cruciata. Anchor-Plant. To 4 ft., with very broad-spiny flattened branches and few small lvs.: fls. yellowish-white, in autumn. S. Brazil, Uruguay; seen in Fla. and S. Calif.

Ephedra. Small shrub with flattened branches: fls. white, in spring. Chile.

horrida: a synonym of the true *C. spinosa* but in hort. applied either to *C. cruciata* or *C. infausta.*

infausta. To 10 ft., the stiff green branches with cylindrical spines to 1 in. long and small lvs.: fls. greenish-white, in early spring. Chile.

spinosa of gardens is *C. infausta* or *C. armata;* the true *C. spinosa* from Peru is not in cult.

COLLINSIA. *Scrophulariaceæ.* Hardy herbaceous attractive annuals with lvs. opposite or in whorls of 3's, the bell-shaped 2-lipped fls. in the axils of the lvs. either solitary or in umbel-like clusters, blooming in midsummer, the colors ranging from white, lilac, rose to violet and clear bright blue; mostly native in W. N. Amer.

Collinsias require only the usual treatment for annuals; the seed may be sown outdoors in autumn, if well protected in winter, but preferably in spring in the North.

bartsiæfolia. SEASIDE C. To 1 ft., sticky: lvs. ovate to linear, 1 in. long: fls. nearly sessile, whitish, marked with lilac or purple, with short upper lip. Calif.

bicolor. To 2 ft., glabrous or sticky: lvs. oblong, toothed, to 2 in. long: fls, nearly sessile, to 1 in. long, lower lip violet or rose-purple, upper lip white. Calif. Var. **candidissima** has all white fls. Var. **multicolor** (*C. multicolor*) has variegated fls.

candidissima: *C. bicolor* var.

grandiflora. BLUE-LIPS. To 15 in.: lvs. oblong to linear, to 1¾ in. long, entire: fls. to ¾ in. long, with pedicels length of fls., lower lip deep blue or violet, upper lip purple or white. Calif. to B. C.

multicolor: *C. bicolor* var.

tinctoria. To 2 ft., sticky, giving off an iodine-like stain: lvs. ovate to lanceolate, to 4 in. long: fls. nearly sessile, pale purplish or nearly white and streaked, the upper lip very short. Calif.

verna. BLUE-EYED MARY. To 2 ft.: lvs. ovate to oblong, to 2 in. long: fls. ½ in. long, long-stalked, lower lip bright blue, upper white or purplish. N. Y. to Wis. and Ky.

COLLINSONIA. HORSE-BALM. HORSE-WEED. STONE-ROOT. *Labiatæ.* Aromatic per. herbs of E. N. Amer., with large opposite lvs. and small yellowish fls. in panicled racemes, the 2 stamens long-exserted; one sometimes grown in the wild-garden in moist woodsy places.

canadensis. CITRONELLA. To 5 ft., with thick clumpy root: lvs. ovate or ovate-oblong, to 10 in. long, coarsely toothed: fls. ½ in. long, lemon-scented, in panicles to 1 ft. long. Que. to Fla. and Ark.

COLLOMIA. *Polemoniaceæ.* Herbs from W. N. Amer. and Chile, allied to Gilia but differing in technical characters, with alternate lvs. and red, yellow or white tubular fls. often borne in heads subtended by leafy bracts.

Of easy cultivation in any garden soil. Propagated by seeds sown where plants are to stand, in open exposures.

biflora (*C.* and *Gilia coccinea*). Ann. to 2 ft.: lvs. linear, toothed or cut near end: fls. scarlet tinged outside with buff. Bolivia, Chile, Argentina.

coccinea: *C. biflora.*

grandiflora (*Gilia grandiflora*). Variable ann. to 2½ ft.: lvs. linear-lanceolate, entire: fls. buff or salmon-color. Rocky Mts. to Calif.

linearis (*Gilia linearis*). Ann. to 16 in.: lvs. linear to linear-lanceolate, entire: fls. red-purple or pink. B. C. to Calif. and Colo.

COLOCASIA (*Leucocasia*). ELEPHANTS-EAR. *Araceæ.* Trop. Asian herbs grown for ornament or the edible tubers, having peltate heart- or arrow-shaped lvs. and unisexual fls. borne on spadices which are shorter than the spathes.

Colocasias are usually planted out-of-doors for subtropical foliage effects, tubers having been started indoors. They should have damp rich soil. The dasheen is grown for the edible roots in warm climates. Tubers may be planted in hills 3 feet apart in rows 4 feet apart. In about seven months the tubers will be ready for harvesting. The young shoots of dasheen forced and blanched are used as a winter vegetable. Taro is also widely grown for food in the Hawaiian and other Pacific Islands, particularly in the form of "poi."

antiquorum. Lvs. ovate-cordate, to 2 ft. long, green, the petioles to 5 ft. long: spathes pale yellow, to 15 in. long; spadix with very long sterile appendage. E. Indies.—Runs into several forms, a few of which are: Var. **euchlora** having dark green lvs. with violet margins and petioles; var. **Fontanesii** with dull green lvs. margined and veined with purple and purplish petioles; var. **illustris** has lvs. spotted with dark green between the veins and violet petioles.

esculenta (*Caladium esculentum*). TARO. EDDO. DASHEEN. Closely resembling the above but having large edible tubers and the spadix with very short sterile appendage.

indica. Lvs. ovate-cordate, to 1½ ft. long, the petioles to 3 ft. long: spathes glaucous, to 6 in. long; spadix with short sterile appendage. Malaya.

monorhiza: hort. name.

multiflora: hort. name.

neo-guineensis: *Schismatoglottis neo-guineensis.*

COLPOTHRINAX. *Palmaceæ.* One species of fan-palm in Cuba, sometimes referred to Pritchardia but differing in the singularly swollen trunk and in technical floral characters as well as in its range. **C. Wrightii** (*Pritchardia Wrightii*). BOTTLE or BARREL PALM, endemic in Pinar del Rio and Isle of Pines. Tree to 40 ft., the trunk much swollen at or below the middle, slender above: lvs. more or less circular in outline, to 5 ft. or more across, with many segms.: fls. sessile, fleshy: fr. globose, ½ in. or more diam.

COLQUHOUNIA. *Labiatæ.* Tender erect or twining shrubs with all parts of the plants white-woolly when young, the fls. scarlet and yellow; native to S. Asia, one cult. somewhat in the S. Propagated by cuttings of growing tips in summer and rooted under glass.

vestita. To 4 ft., permanently white-woolly: lvs. oval or ovate, to 2½ in. long, wavy-toothed: fls. orange-scarlet, ¾ in. long, in whorls, autumn and winter.

COLTSFOOT: *Tussilago Farfara.* **Sweet:** *Petasites fragrans.*

COLUMBINE: *Aquilegia.*

COLUMBO: *Frasera.*

COLUMN: body formed of union of stamens and pistil in orchids, or of stamens, as in mallows.

COLUMNEA. *Gesneriaceæ.* Trop. American shrubs or vines with opposite lvs., 2-lipped tubular red or yellow fls. solitary or clustered in the axils, and fr. a berry; grown in the greenhouse. Propagated by cuttings.

gloriosa. Per., epiphytic, hairy: lvs. ovate to ovate-oblong, to 1¼ in. long, strongly nerved: fls. scarlet and yellow, to 3 in. long, 2-lipped, solitary. Costa Rica.

COLUTEA. BLADDER SENNA. *Leguminosæ.* Shrubs from the Medit. region to the Himalayas, with deciduous pinnate lvs., papilionaceous fls. in axillary few-fld. racemes, and inflated bladder-like pods; planted for ornament and hardy N. Propagated by seeds, cuttings in autumn, or choice varieties by grafting on *C. arborescens.*

arborea is *arborescens.*

arborescens. To 15 ft.: fls. yellow, the wings about as long as keel: pods to 3 in. long. S. Eu., N. Afr. Var. **bullata** is a dwarf form with small lfts. Var. **crispa** has wavy-edged lvs.

cilicica (*C. longialata*). Differs from *C. arborescens* in the wings being longer than the keel. Asia Minor.

cruenta: *C. orientalis.*

halepica: *C. istria.*

istria (*C. halepica*). To 6 ft.: fls. orange-yellow, the wings longer than keel. Asia Minor.

longialata: *C. cilicica.*

media. Hybrid probably between *C. arborescens* and *C. orientalis*: to 10 ft.: fls. orange or reddish-yellow.

orientalis (*C. cruenta*). To 6 ft.: fls. brownish-red with yellow spot at base of standard, the wings shorter than keel: pods 1½ in. long. S. E. Eu., Asia.

COLVILLEA. *Leguminosæ.* One African tree rarely planted in semi-trop. regions for the showy bloom. Propagated by seeds. C. racemosa. To 50 ft., with thick trunk: lvs. 2-pinnate into segms. ½ in. long: fls. scarlet with yellow stamens, in dense drooping racemes to 1½ ft. long: pods round.

COLZA: *Brassica Napus.*

COMAROSTAPHYLIS: *Arctostaphylos diversifolia.*

COMARUM: *Potentilla palustris.*

COMBRETACEÆ. Combretum Family. Trees and shrubs of about 15 trop. genera, in eastern and western hemispheres, characterized by simple lvs., mostly small bisexual fls. having 4–8-lobed calyx, 4–5 petals or none, 4–10 stamens, inferior 1-celled ovary, and dry often winged fr. Combretum, Quisqualis and Terminalia are cult. for ornament and fr.

COMBRETUM. *Combretaceæ.* Trop. trees and shrubs, often climbing, with mostly opposite entire lvs., polygamous fls. in spikes or racemes, the stamens long-exserted, and leathery 4–6-winged frs.

coccineum (*Grislea coccinea*). Vine to 20 ft.: lvs. oblong, to 4 in. long: fls. bright red, ½ in. long, in terminal panicled racemes. Madagascar.

secundum. Vine: lvs. oval-oblong, to 6 in. long: fls. scarlet, 1½ in. long, in dense terminal spikes. Trinidad, N. S. Amer.

COMESPERMA. *Polygalaceæ.* Australian herbs or shrubs, often twining, with small alternate lvs. and irregular fls. in terminal racemes; one planted in Calif.

spinosum. Much branched leafless shrub with thorny branches, the lvs. reduced to scales: fls. small, solitary and scattered.

COMFREY: *Symphytum.*

COMMELINA. Day-Flower. *Commelinaceæ.* Widely distributed herbs with jointed sts., alternate entire lvs. and irregular mostly blue short-lived fls. in cymes subtended by a leafy bract; grown in greenhouses or out-of-doors, often as ground-cover. Propagated by seeds, cuttings over heat, or division of the tubers when produced.

angustifolia. Sts. erect or diffuse, to 2 ft. or more long: lvs. nearly or quite linear, to 5 in. long: sheaths often purplish: fls. blue. S. U. S.

cœlestis. Per. with fibrous or tuberous roots, to 1½ ft. high: fls. deep blue, to 1 in. across. Mex.—A frequent greenhouse plant. Var. alba has white fls. and variegata blue and white.

nudiflora (*C. Sellowiana*). Creeping per. with sts. rooting at joints: fls. blue, to ½ in. across. N. Amer., S. Amer., Asia, Afr., growing natively as far north as N. J.—Employed as an open-garden plant.

Sellowiana: *C. nudiflora.*

tuberosa. Branching and diffuse per. with tuberous roots: fls. deep blue, about 1 in. across. Mex.—Produces fls. first season from seed; tubers or roots may be lifted and stored over winter, or it may be treated as a greenhouse plant.

COMMELINACEÆ. Spiderwort Family. Herbs of about 26 genera widely scattered, particularly in the tropics, with simple, alternate, parallel-veined, mostly sheathing and entire lvs., bisexual fls. in cymes subtended by leafy bracts (spathes), having 3 sepals and petals, mostly 6 stamens, superior 2–3-celled ovary and capsular or sometimes berry-like frs. The family provides many ornamental subjects, the larger part of which are grown under glass in the N. The genera known to hort. are Commelina, Cyanotis, Dichorisandra, Palisota, Pollia, Rhœo, Spironema, Tinantia, Tradescantia, Zebrina.

COMPASS-PLANT: *Silphium laciniatum.*

COMPOSITÆ. Composite Family. Over 800 widely dispersed genera of herbs and sometimes shrubs characterized by the fls. being assembled in involucrate heads and with the anthers joined around the pistil; corolla gamopetalous, often of 2 kinds in one head, regular and 4–5-lobed, and ligulate or produced into a long limb on one side; stamens 4–5; ovary inferior, 1-celled: fr. an achene mostly crowned by a pappus of scales, barbs or hairs. The family contains numerous ornamental subjects and others grown as vegetables. Most of them are sun-loving plants of simple cultural requirements; the predominant types are summer- and autumn-blooming. The genera known to hort. are Achillea, Ageratum, Amberboa, Amellus, Ammobium, Anacyclus, Anaphalis, Antennaria, Anthemis, Aphanostephus, Arctium, Arctotis, Arnica, Artemisia, Aster, Baccharis, Baeria, Balsamorhiza, Bellis, Bellium, Berlandiera, Bidens, Boltonia, Brachycome, Brachyglottis, Brickellia, Buphthalmum, Calendula, Calimeris, Callistephus, Calocephalus, Carduus, Carlina, Carthamus, Cassinia, Catananche, Celmisia, Centaurea, Charieis, Chrysanthemum, Chrysogonum, Chrysopsis, Chrysothamnus, Cichorium, Cirsium, Cladanthus, Cnicus, Coreopsis, Corethrogyne, Cosmos, Cotula, Craspedia, Crepis, Crupina, Cryptostemma, Cynara, Dahlia, Dimorphotheca, Diotis, Doronicum, Echinacea, Echinops, Emilia, Encelia, Ericameria, Erigeron, Eriocephalus, Eriophyllum, Erlangea, Eupatorium, Felicia, Gaillardia, Galactites, Gamolepis, Garberia, Gazania, Gerberia, Gnaphalium, Grindelia, Guizotia, Gynura, Helenium, Helianthella, Helianthus, Helichrysum, Heliopsis, Helipterum, Heterospermum, Hidalgoa, Hieracium, Humea, Hypochœris, Inula, Krigia, Kuhnia, Lactuca, Lasthenia, Layia, Leontopodium, Lepachys, Leptosyne, Leucheria, Leuzea, Liatris, Ligularia, Linosyris, Lonas, Madia, Malacothrix, Matricaria, Melampodium, Microglossa, Mikania, Montanoa, Moscharia, Mutisia, Myriocephalus, Notonia, Olearia, Onopordum, Othonna, Pachystegia, Parthenium, Perezia, Petasites, Picris, Piqueria, Podochænium, Podolepis, Polypteris, Prenanthes, Pulicaria, Raoulia, Reichardia, Rudbeckia, Santolina, Sanvitalia, Saussurea, Scolymus, Scorzonera, Senecio, Sericocarpus, Serratula, Silphium, Silybum, Solidago, Sonchus, Spilanthes, Stephanomeria, Stevia, Stokesia, Tagetes, Tanacetum, Taraxacum, Thelesperma, Tithonia, Tolpis, Townsendia, Tragopogon, Tridax, Trilisa, Tussilago, Uropappus, Ursinia, Venidium, Verbesina, Vernonia, Vittadinia, Wedelia, Wyethia, Xanthisma, Xeranthemum, Zinnia.

COMPOSITE: compound; said of an apparently simple or homogeneous organ or structure made up of several really distinct parts; applied to the heads of the family Compositæ.

COMPOUND: of two or more similar parts in one organ, as a leaf of 2 or more leaflets, a fruit of 2 or more carpels.

COMPRESSED: flattened, especially sidewise.

COMPSOA: *Tricyrtis.*

COMPTONIA. *Myricaceæ.* One fragrant deciduous shrub native in E. N. Amer., adapted for covering banks or dry sandy soil. **C. asplenifolia** (*C. peregrina. Myrica asplenifolia*). Sweet-Fern. To 5 ft.: lvs. fern-like, linear-oblong, deeply pinnately cut, pubescent: fls. unisexual, in catkins.—Propagated by seeds, layers, and division of the clumps.

CONANDRON. *Gesneriaceæ.* One stemless tuberous-rooted herb native in the mts. of Japan and suitable for rock-gardens in S. U. S. **C. ramondioides.** Lvs. basal, to 7 in. long, oblong, wrinkled and toothed; fls. white or pink with purple eye, 1 in. across, in drooping clusters on scapes to 1 ft. long.

CONCHITA: *Centrosema.*

CONDALIA. *Rhamnaceæ.* Shrubs and trees inhabiting the New World, mostly in warm regions, with alternate usually entire lvs. and fls. in umbels, with or without petals; one species is grown out-of-doors in Calif.

lineata. Spiny shrub: lvs. spatulate or obovate, ⅓ in. long, leathery, without veins above: fls. whitish, without petals: fr. an oblong drupe ¼ in. long. Patagonia.

CONE: a dense and usually elongated collection of flowers or fruits borne beneath scales, the whole with scales and axis forming a detachable homogeneous fruit-like body; some cones are of short duration, as those of araucaria, and others become dry, woody and durable.

CONEFLOWER: *Echinacea, Lepachys, Rudbeckia.*

CONE-PLANT: *Conophytum.*

CONFEDERATE-ROSE: *Hibiscus mutabilis.*

CONFEDERATE-VINE: *Antigonon leptopus.*

CONGEA. *Verbenaceæ.* Malayan climbing shrubs with opposite entire lvs., fls. in head-like cymes subtended by leaf-like bracts and borne in large panicles, and fr. a small drupe; one species sometimes grown out-of-doors in S. Calif. and other mild climates.

tomentosa. Lvs. ovate, to 3 in. long, tomentose beneath: fls. white, the oval bracts to 1 in. long, white or lilac. tomentose. India.

CONICOSIA. *Aizoaceæ.* S. African segregate from Mesembryanthemum (which see for cult.), per. with erect or procumbent sts., alternate crowded long narrow 3-sided soft lvs. without dots, and large yellow pedicelled fls.; stigmas 10–20.

elongata (*M. elongatum*). St. ann., prostrate, 1 ft. or more, from a tuberous root: lvs. to 6 in. long and ¼ in. thick, semi-cylindrical: fls. solitary on peduncles to 6 in. long, the petals linear.—Somewhat escaped in Calif.

pugioniformis (*M. pugioniforme*) has a tall thick st. to 2 ft.: lvs. to 6 in. long, glaucous, 3-angled, gradually tapering from base to apex (pugioniform or dagger-shaped): petals as long as calyx-lobes.—Plants passing under this name may be *C. capensis*, a weak not erect plant and petals shorter than calyx-lobes. *C. Muirii* may be involved: it has a long fleshy radish-like tuber crowned by the tuft of lvs., whereas *C. capensis* has a fibrous root and a st. 2–3 ft. long.

CONIFERS. A general term employed for cone-bearing trees of the pine, spruce and cypress kind, but sometimes used as the English equivalent of Coniferæ a technical family name for plants now segregated in the three families Ginkgoaceæ, Taxaceæ and Pinaceæ. These three families may be briefly distinguished as follows: Ginkgoaceæ, lvs. fan-shaped and deciduous, fr. a drupe; Taxaceæ, lvs. mostly broadly needle-shaped or scale-like or at least not fan-shaped, persistent, fr. soft and berry-like or drupe-like; Pinaceæ, lvs. mostly narrowly needle-like, persistent (except the larches and bald cypress), fr. typically a dry cone but the parts sometimes more or less fleshy and cohering into a berry-like body as in the junipers.

The conifers are gymnosperms, representative of a class of plants with ovules naked rather than borne in a sac or ovary as in the angiosperms; other living gymnosperms are the cycads, of about 10 genera. Gymnosperms and angiosperms together comprise the spermatophytes (phenogams or "flowering plants"). The conifers, in a broad usage to include also ginkgo, the junipers and yews, are about 300 species, in about 40 genera, widely spread over the globe but most prominent in temperate regions; they are all woody plants, many of them shrubs and others majestic trees that give character to extensive areas. They are well represented in the native flora of North America. To cover the families Taxaceæ and Pinaceæ, the word conifer has a definite connotation even though some of the kinds bear berry-like fruits rather than true cones; but the characters of foliage and of woody structure, and the balsamic odors, are such as to show the similarities of most of them even to uncritical observers. A few species, as the larches, bear deciduous leaves, but the group as a whole is known as "the evergreens" and it has a horticultural unity. The conifers are treated in their various relations and adaptabilities for American conditions in "The Cultivated Evergreens," published by the Macmillan Company.

Conifers are grown for ornament as single specimens, for shelter-belts, the smaller ones for foundation-planting about buildings and in private grounds, and the arboreous species for groves and forests. The timber trees among the conifers constitute the main large forestry plantings in this country. All the kinds abound in interest, because of their evergreen character and their strong individuality. Although lacking showy flowers, the striking habit, interesting cones, details of foliage and color of new growths give them an ornamental quality quite their own. They are particularly striking in the winter landscape. These qualities vary widely between the different genera. Most of the genera are known in cultivation somewhere in the United States and Canada. They are listed under the entries *Pinaceæ* and *Taxaceæ;* and each genus also finds its alphabetic place in the book.

The conifers are mostly high-land plants. Many of them do well on rather thin land, yet the best results are to be expected, in private grounds, when the soil is good or well enriched for much of the beauty depends on the verdurous growth. For low grounds, the larches, taxodiums, and chamæcyparis may be chosen. The common arbor-vitæ is particularly valuable in low and even swampy places. For effects in large trees, the pines, spruces and firs are generally most adaptable, particularly in cold climates, but cryptomeria, Douglas fir, and sequoias are majestic in milder climates. Of the smaller and shrubby kinds, selections may be made among the true cypresses, junipers, chamæcyparis, thuja, yews; the retinisporas are juvenile states of chamæcyparis and thuja. Inasmuch as so many species of conifers are available for cultivation from so many parts of the world and of such varied characteristics, it follows that the successful planter of them is the one who notes with much care the requirements of each as to climate, soil and exposure.

Seedlings of many conifers vary widely, as in Thuja, Juniperus, Chamæcyparis, and even in some species of Picea. The dwarf forms originating in this way, propagated often by cuttings and layers, are specially interesting for small places and for rock-gardens, and they have the charm of special form and variety of color.

Transplanting of conifers is best performed, as a rule, in spring just before the active new growth begins or about when the buds begin to swell. Early autumn planting is satisfactory in mild climates and with small potted or pruned stock if the land is moist and in good condition and the exposure protected so that they do not dry out seriously before making a roothold. August planting, after the main growth is completed, is often successful if the rainfall is adequate or sufficient water can be supplied. The younger the tree the greater is the likelihood of success in transplanting; but the usual height for the arboreous species is 2 to 3 feet; any additional height is likely to entail greater care in the transplanting. Very large conifers should be moved only by those skilled in the work. Experience shows that moving large conifers with a frozen ball of earth large enough to include all the roots is usually successful.

The top is not pruned, as a rule, at transplanting. Therefore the roots should be kept intact as much as possible, special care being exercised in the digging, and they should not be allowed to dry out. Plants from shady positions should not be transplanted to the open sun. If the hemlock, for example, is wanted in a sunny exposed place, young trees occupying such positions in the wild should be found. Better results, however, with all conifers, are to be expected from well-handled nursery-grown plants. Newly planted trees may be mulched the first year with straw or similar material to retain the moisture. All the conifers, and especially the hemlocks, should be well guyed after transplanting, for loss is certain if the newly planted tree is racked by the wind.

The after care of conifers requires no peculiar attention except to meet the attacks of the special insects and fungi, and for this work the most recent authoritative books or bulletins should be consulted. Probably the most serious of the diseases at present, since it involves natural forests, is the white pine blister-rust, due to an imported fungus. It attacks the five-leaved or white pines, appearing on the twigs and extending into the trunk. Thorough removal of the blistered or cankered twigs from valuable trees as soon as the injury appears may save the specimen. But the main procedure is to destroy the alternate host on which the fungus lives. These other hosts are currants and gooseberries, and none of these plants should be allowed to stand within 200 to 300 yards of white pines; the cultivated black currant is particularly amenable to the disease. For aphis and scale insects, thorough spraying is the proper safeguard. The five-needle pines also suffer from the white pine weevil, which attacks the leading shoots.

Conifers require the minimum of pruning inasmuch as most of them are symmetrical growers. Pines seldom give satisfactory results when clipped. To keep spruces, firs and some of the smaller kinds within bounds or to make them compact and to delay the death of the lower limbs, the tips of the shoots may be pinched back in spring or early summer.

Propagation of conifers is accomplished by means of seeds, cuttings, grafting on other stocks. Seeds are the usual means for the raising of forest stock and for the propagation of the species in general. The horticultural varieties, however, must be increased by cuttings, for seedlings may not come true. Species of which seed is not available, and also certain of the named cultivated varieties, are grafted on other stocks.

Seeds are gathered as soon as ripe and kept in bags or boxes in a dry place until the following spring or else stratified over winter. The seeds are planted in rows in a mellow well-prepared seed-bed, and covered one-half inch or less depending on the size. Small seeds may be broadcast. Rows are usually as close together as 6 inches, and the bed is strewn with pine needles or other mulch.

The young seedlings require protection under lath screens or brush and plenty of moisture, although the seeds themselves may be kept fairly free from water until germination takes place; seed-beds therefore should be in well-drained soil. If mice, squirrels or birds are likely to be troublesome, the beds may be covered with wire netting; the beds would better be protected from washing by a border of boards. Care must be taken to avoid damping-off under the screens. The plants will need protection the first winter. Care should be taken to keep the young seedlings constantly lightly mulched to prevent rain from spattering them with soil, which adheres to the young plants and causes considerable loss. In eighteen months or more, when making the first set of rough leaves, the seedlings may be transplanted; and the subsequent process will determine itself for each species. Conifer seeds may also be stratified the first autumn in boxes or flats, and the seedlings allowed to grow in these boxes the first year; this is a good method for small quantities or for garden practice, and for tender species. Seedlings of some of the rarer species, as of Abies, are so small that it is inadvisable to transplant them until the end of the second year.

Cuttings are made from firm tip shoots late in the season, representing one-year wood and a two-year base, the bottom third or half being trimmed of leaves. These are set in clean sand or peat in flats or a greenhouse bench, close together in rows and the soil firmed tightly about them. Mild bottom heat should be given at first, and raised to perhaps 70° later. In four to eight months, depending on the kind of conifer and the conditions, the cuttings should be rooted and ready for transplanting. Taxus, cedrus, thujas, retinisporas, chamæcyparis, junipers, and the like are the kinds most commonly grown from cuttings, although the piceas and others are amenable. Piceas and others that contain a large amount of resin are the most difficult to root, and removal of the resin by dipping the lower end in hot water has been recommended.

Cuttings may also be rooted in outdoor summer frames, with bottom heat provided by a little fermenting manure or other means; a fair percentage of some kinds will root without other bottom heat than that supplied by the sun. (Fig. 18, page 497.)

Grafting of conifers is performed on stocks of the same genus, usually in spring when the roots begin to start. The stocks may be grown from seeds or cuttings, usually the former. The stock in any case represents the most abundant or most easily propagated or most seedful species of the genus, as red-cedar for the other junipers, native arborvitæ for the other thujas, Norway spruce for the other piceas, white pine for related species, and so on. When large enough for grafting, the stocks are potted and the cion is side-worked near the root and firmly tied. The grafted plants are kept in frames or a propagating house, and in four to six weeks union should have taken place. (Pages 283, 284.)

CONIOGRAMME (*Dictyogramma*). *Polypodiaceæ.* Strong-growing conservatory ferns, useful as specimen plants; lvs. 1–2-pinnate; sori naked, following the veins; native in Japan and Pacific Isls. Sometimes cult. under glass, requiring a rather cool or moderate atmosphere and a well-drained soil. See *Ferns.*

japonica (*Gymnogramma japonica*). BAMBOO-FERN. Lvs. mostly 1-pinnate, to 2 ft. long, segms. to 1 ft. long and 1 in. wide, finely toothed. Japan, Formosa.

CONIUM. *Umbelliferæ.* Poisonous herbs with pinnately decompound lvs., small white fls. in compound umbels, and ovate somewhat flattened frs.; one species grown for medicinal purposes. Propagated by seeds.

maculatum. POISON-HEMLOCK. Bien. to 4 ft.: lvs. finely cut into ovate toothed segms., dark green, sometimes known as "winter-fern." Eu.; nat. in N. and S. Amer.

CONNATE: united or joined; in particular, like or similar structures joined as one body or organ, as opposite leaf-blades united about a stem.

CONNECTIVE: the filament or tissue connecting the two cells of an anther, particularly when the cells are distinctly separated.

CONNIVENT: coming together or converging, but not organically connected.

CONOCLINIUM: *Eupatorium.*

CONOPHYTUM. CONE-PLANT. *Aizoaceæ.* One of the groups separated from the old polymorphous genus Mesembryanthemum (which see). Species of this genus are growing in test collections but which ones, if any, are in popular cult. in N. Amer. is not yet understood. They are very small succulent plants with abbreviated roots, several or many growths in a clump but stemless at least when young. Each of the growths consists of 2 lvs. completely joined into one body which is globose, obconic, or depressed, 2-lobed or notched at apex and with a small orifice at the center; from this orifice arises a solitary fl., the corolla having a slender tube, color white to rosy, magenta, red, yellow. They are strange condensed little objects, with only a plant body and a fl.; they should appeal to fanciers.

CONVALLARIA. LILY-OF-THE-VALLEY. *Liliaceæ.* One per. herb (or the variations considered as distinct species), having horizontal rootstocks, the upright parts called "pips." **C. majalis.** Lvs. 2, basal, oblong-oval: fls. bell-shaped, white, fragrant, nodding, in a one-sided raceme terminating the scape. Eu., Asia, E. N. Amer. Var. **Fortunei** has larger foliage and fls.

The lily-of-the-valley is hardy out-of-doors in shady places and persists for many years without removal. It is often forced from pips planted in benches of sand in the greenhouse and kept at a temperature of about 65°. The pips are often held in cold storage.

CONVOLVULACEÆ. MORNING-GLORY FAMILY. Twining herbs as usually known, but often shrubs or even trees, of nearly or about 50 widely distributed genera: juice often milky: lvs. alternate, simple or compound: fls. regular and bisexual, often large and bright-colored, with 5-parted calyx, funnelform gamopetalous corolla, 5 stamens, superior prevailingly 2-celled ovary: fr. a caps. or berry. Many species have medicinal properties and other kinds are grown for ornament, as Argyreia, Calonyction, Convolvulus, Evolvulus, Ipomœa, Jacquemontia, Lettsomia, Porana, Quamoclit.

CONVOLVULUS. Bindweed. *Convolvulaceæ.* Herbs, mostly twining or trailing, pubescent, with simple or lobed lvs., bell-shaped or funnelform fls. something like those of morning-glory, having a plaited 5-angled limb, and capsular frs. *C. arvensis* is a persistent weed in cult. grounds.

Bindweeds are of easy cultivation but should be planted with care as they are likely to become troublesome weeds. They are grown out-of-doors as covering for fences and banks and the tender kinds in the greenhouse. Propagated by seeds, cuttings of young wood, and by division.

althæoides. Per., sts. twining to 3 ft.: lower lvs. ovate-cordate, upper pinnatifid: fls. 1–2, pink, about 1 in. long. Medit. region.

arvensis. Per. vine with deep persisting roots, glabrous or nearly so: lvs. oblong to ovate with sagittate or hastate base, to 2 in. long: fls. pink or whitish, to 1 in. across. Eu.; nat. and a troublesome weed, but has been used in hanging baskets and elsewhere.

aureus superbus. Per. but grown as ann., sts. twining or trailing to 5 ft.: lvs. cordate-ovate: fls. golden-yellow. Of uncertain origin and botanical position.

Cantabrica. Erect or prostrate, to 2 ft.: lvs. oblong or lanceolate: fls. in clusters, rose or pink, about ½ in. long. Medit. region.

Cneorum. To 4 ft., erect or ascending: lvs. lanceolate or spatulate, persistent: fls. 1–6, white or pinkish. S. Eu.

Cupanianus: *C. tricolor.*

elongatus. Ann.: lvs. cordate-ovate: fls. solitary, white, small. Canary Isls.

floridus (*Rhodorhiza florida*). To 6 ft., woody: lvs. linear-lanceolate: fls. in many-fld. terminal clusters, white or pale pink, small. Canary Isls.

incanus. Finely pubescent usually gray per., trailing or decumbent, to 3 ft.: lvs. ovate, lanceolate, linear, with diverging lobes at base, to 2 in. long: fls. rose to white. Neb. west and south.

japonicus (*Calystegia pubescens*). California-Rose. Per., sts. twining to 20 ft.: lvs. narrow-arrow-shaped: fls. solitary, bright pink, to 2 in. across. E. Asia; a sterile double form is nat. in E. U. S.

luteolus. Per. somewhat woody below, climbing to 10 ft. or more: lvs. triangular to lanceolate with sagittate base, to 3 in. long, glabrous and glaucous above: fls. purplish and white, to 2 in. long. Calif.

mauritanicus. Per., sts. prostrate, woody at base: lvs. round-ovate, small: fls. 1–6, blue or violet-purple with pale throat, to 2 in. across. Afr.—Useful in baskets and vases.

pentapetaloides. Ann., sts. prostrate: lvs. oblong or linear-lanceolate: fls. solitary, blue. S. Eu., W. Asia.

sepium. Rutland Beauty. Per., sts. trailing to 10 ft.: lvs. ovate-cordate or arrow-shaped: fls. solitary, white, rose or pink striped with white, 2 in. long. Eu., Asia, N. Amer.

siculus. Ann., sts. prostrate, to 1½ ft.: lvs. ovate-cordate: fls. solitary, pale blue, small. Medit. region.

Soldanella. Per., sts. prostrate. to 1½ ft.: lvs. kidney-shaped: fls. solitary, pink, to 2½ in. across. Seashores around the world.

tricolor (*C. Cupanianus*). Dwarf Morning-Glory. Ann., sts. erect or ascending to 1 ft. and often much branching: lvs. linear-oblong: fls. 3, blue with yellow throat margined white, to 1½ in. across. S. Eu.—An old flower-garden subject.

undulatus. Ann., sts. ascending: lvs. ovate-oblong, undulate: fls. in nearly sessile clusters, blue. Medit. region.

COONTIE: *Zamia floridana, Z. pumila.*

COOPERIA. Rain- or Prairie-Lily. *Amaryllidaceæ.* Bulbous night-blooming herbs with basal grass-like lvs. and fragrant white salverform fls. solitary at end of scapes, the perianth-tube long.

Sometimes planted. Of easy cultivation. The bulbs should be stored over winter in dry soil. Much like Zephyranthes; flowers in spring and summer, with the narrow leaves.

Drummondii. Fls. white tinged with red outside, to 6 in. long, the tube to 5 in. long. Tex., New Mex., Mex.

pedunculata. Fls. white tinged red outside, to 3 in. long, the tube to 1½ in. long. Tex.

COPAIFERA (*Copaiva*). *Leguminosæ.* Trees of trop. Amer. and Afr., yielding balsam of copaiba: lvs. pinnate, leathery: fls. small, usually white, not papilionaceous, borne in panicles.

officinalis. To 70 ft.: lvs. of 1–5, usually 3, pairs of ovate lfts. to 3 in. long: pods ovoid-globose, slightly flattened. Trinidad, N. S. Amer.

COPAIVA: *Copaifera.*

COPERNICIA. *Palmaceæ.* Tall or middle-sized hermaphrodite fan-palms of about 9 species Cuba to Argentina, unarmed except on petioles: spadices very long, much branched, borne among the lvs. and often surpassing them; fls. solitary or glomerated on the slender branches, numerous; stamens 6, inserted in tube of perianth and connate at base: fr. globose or ovoid, more or less succulent, of 1 carpel, small. One or 2 species sometimes planted in S. Calif. and S. Fla., but little known in the continental U. S. See *Palm.*

australis. To 70 ft. or perhaps more: lf.-blade orbicular, 2–2½ ft. long, whitish underneath, bearing many rusty dots, deeply divided into about 48 narrow acuminate bifid segms. with very small deciduous filaments; petiole strongly armed: fr. ovoid-olive-form, ¾ in. or less long. Paraguay, Argentina.

cerifera. Carnauba Palm. To 30 or 40 ft., with globose dense head, lower part of trunk long retaining the lf.-bases: lf. 4–6 ft. long, nearly orbicular, light colored with a waxy covering, divided to the middle or beyond into about 60 narrow segms. that are bifid into long very narrow points; petiole with remote spines: fr. ovoid to globose-ovoid, about 1 in. long. Brazil.

COPPERLEAF: *Acalypha Wilkesiana.*

COPPERTIP: *Crocosmia aurea.*

COPRA: see *Coconut.*

COPROSMA. *Rubiaceæ.* Shrubs or small trees native from Hawaii to Australia and Borneo, one in Chile, with opposite persistent lvs., small diœcious white or greenish fls. in clusters or solitary, the corolla bell-shaped or funnelform and 4–5-lobed, and fr. a fleshy drupe.

Coprosmas are grown for ornament in the open ground in California and other warm regions, for the attractive foliage and fruit, and some of them for hedges. Propagated by cuttings of ripe wood.

areolata. To 15 ft.: lvs. orbicular-spatulate, to ⅔ in. long, acute or apiculate: fr. black, globose, ⅙ in. across. New Zeal.

Baueri (*C. Stocki*). To 25 ft., withstanding clipping and useful in hedges: lvs. ovate or oblong, to 3 in. long, obtuse or notched, thick and shining: fr. orange-yellow, ovoid, ⅓ in. long. New Zeal. Var. **variegata** has lvs. blotched with yellowish-green.—The usual species in cult.

cuneata. To 10 ft., very leafy: lvs. linear- or cuneate-oblong, to ¾ in. long, usually clustered, stiff and leathery: fr. red, globose, ⅙ in. across. New Zeal.

Cunninghamii. To 15 ft.: lvs. linear or linear-lanceolate, to 2 in. long, acute, leathery: fr. pale and translucent, oblong, ¼ in. long. New Zeal.

Kirkii. To 4 ft. or procumbent, much branched: lvs. linear or linear-oblong, to 1 in. long, obtuse: fr. oblong, ⅙ in. long. New Zeal.

lucida. To 15 ft.: lvs. obovate, to 5 in. long, obtuse or acute, leathery and shining: fr. reddish-orange, oblong, ½ in. long. New Zeal.

macrocarpa. To 12 ft.: lvs. ovate-oblong, to 7 in. long, obtuse or acute, leathery and glossy: fr. ovoid, to 1 in. long. New Zeal.

microcarpa. To 12 ft.: lvs. linear, to ⅓ in. long: fr. globose, 1/10 in. across. New Zeal.

parviflora. To 15 ft.: lvs. obovate, to ¾ in. long, usually clustered, leathery: fr. bluish or black, globose. ⅛ in. across. New Zeal.

Petriei. Creeping, making mats and useful for rock-work: lvs. about ¼ in. or less long, narrow-oblong or obovate, hairy: fls. solitary on short branchlets: fr. purplish, to ½ in. diam. New Zeal.

ramulosa. To 4 ft., prostrate or decumbent: lvs. linear-obovate, ⅓ in. long: fr. dark red, globose, ⅙ in. across. New Zeal.

rhamnoides. To 6 ft.: lvs. orbicular to narow-oblong, to ¾ in. long: fr. red or rarely black, globose, ⅙ in. across. New Zeal.

rigida. To 15 ft.: lvs. obovate, to ¾ in. long: fr. yellow, oblong, to ⅓ in. long. New Zeal.

robusta. To 15 ft.: lvs. oval, to 5 in. long, acute, leathery, dark green and shining above, pale beneath: fr. orange, oblong, ½ in. long. New Zeal.

rotundifolia. To 12 ft.: lvs. orbicular or ovate-oblong, to 1 in. long: fr. red, globose, ⅙ in. across. New Zeal.

rugosa. To 10 ft.: lvs. narrow-linear, to ¾ in. long: fr. pale blue, oblong or nearly globose, ⅓ in. long. New Zeal.

spathulata. To 5 ft.: lvs. orbicular, to 1½ in. long, with winged petiole, obtuse or notched: fr. black, globose, ¼ in. across. New Zeal.

Stocki: *C. Baueri.*

tenuicaulis. To 8 ft., much branched: lvs. orbicular, ½ in. long, obtuse: fr. black and shining, globose, ⅛ in. diam. New Zeal.

tenuifolia. To 15 ft.: lvs. ovate to ovate-lanceolate, to 4 in. long, brownish-green above, pale beneath: fr. ovoid, ⅓ in. long. New Zeal.

COPTIS. Goldthread. *Ranunculaceæ.* Little per. herbs with slender rootstocks which yield a yellow dye and have medicinal properties: lvs. basal, compound: fls. white or yellow, borne on scapes, with petal-like sepals, small hood-like petals and numerous stamens; native in north temp. zone.

One or two species sometimes planted in the border or rock-garden. The plants thrive in shady damp situations in peaty soil. Leaves remain green all winter if given some protection. Propagated by seeds which should be covered with leaves or paper and kept moist.

grœnlandica. To 6 in., the rootstocks yellow: lvs. shining, long-stalked, of 3 broadly obovate coarsely toothed petiolulate lfts.: fls. white, usually solitary, about ½ in. across, the petals broader than long, May–Aug. N. E. N. Amer., in bogs and damp mossy woods.—Until recently confused with the following species.

trifolia. Lfts. sessile or essentially so: petals rather narrow, mostly rhombic and as long as broad. N. E. Asia, Alaska.

CORAL-BELLS: *Heuchera sanguinea.*

CORAL-BERRY: *Symphoricarpos orbiculatus.*

CORAL-BLOW: *Russelia.*

CORAL-BUSH: *Templetonia retusa.*

CORALLITA: *Antigonon leptopus.* **White:** *Porana paniculata.*

CORAL-PLANT: *Jatropha multifida, Russelia equisetiformis.*

CORAL-TREE: *Erythrina.*

CORAL-VINE: *Antigonon leptopus.*

CORCHO: *Microcycas calocoma.*

CORCHORUS. *Tiliaceæ.* Trop. herbs or subshrubs with alternate simple toothed lvs., very small yellow fls., and capsular frs.; grown for the fiber contained in the inner bark and the young shoots eaten as pot-herbs.

Jute requires a warm moist climate and loam soil. Seed may be sown broadcast in spring and the crop will be ready to harvest in about three months. The fiber is grown from Egypt to Japan.

capsularis. Jute. Ann., to 15 ft.: lvs. oblong, to 4 in. long: fr. globose and wrinkled. India.

japonicus: *Kerria japonica.*

olitorius. Jews-Mallow. Differs from *C. capsularis* only in its elongated and beaked fr. India.

CORDATE: heart-shaped; ovate in general outline, with a sinus and rounded lobes at base.

CORDIA. *Boraginaceæ.* Trop. trees and shrubs, sometimes partially climbing, in Old and New Worlds, with alternate simple lvs. and white or orange mostly 4-merous fls. in forking bractless clusters or coiled cymes, bisexual or polygamous, the corolla tubular or bell-shaped. The genus is polymorphous and is divided by some authors; some of the species bear very small fls., others large and showy ones: fr. a drupe.

Grown in the greenhouse, and out-of-doors in warm regions, for ornament. Propagated by seeds and cuttings.

alba. Tree to 30 ft.: lvs. broad-ovate to roundish, rough, to 4 in. long: fls. papery, white, ½ in. across, in large open clusters: fr. an oblong drupe about ½ in. long. American tropics.

Boissieri. Evergreen shrub or tree to 25 ft.: lvs. ovate or oblong-ovate, to 5 in. long, velvety-tomentose, wavy: fls. white with yellow center, 1½ in. long, in terminal clusters. Tex. to Mex.

Myxa. Deciduous tree to 40 ft.: lvs. broad-ovate, stiffish, to 5 in. long, glabrous, entire or wavy-toothed: fls. white, polygamous, ½ in. or less long, in large clusters: fr. tan-colored, ¾ in. diam., mucilaginous and used in medicine. India to Australia; planted in Calif. and American tropics.

Sebestena (*Sebesten Sebestena*). Geiger-Tree. Evergreen shrub or tree to 30 ft.: lvs. ovate, to 8 in. long, rough-hairy, margins entire or wavy: fls. orange or scarlet, to 2 in. long, in large terminal clusters. Fla. keys and south.

thyrsiflora: *Ehretia thyrsiflora.*

CORDULA. Lady-Slipper. *Orchidaceæ.* Stemless epiphytic or terrestrial orchids native in trop. Asia and Malaya, with leathery lvs. and fls. solitary or few on a stalk, the lateral sepals united and the lip sac-like; here belong most of the greenhouse cypripediums which have formerly been listed under Paphiopedilum. For cult. see *Orchids.*

Actæus: *C. Simoni.*

Albertiana: a form of *C. Leeana.*

Alexandræ. Hybrid between *C. Godefroyæ* and *C. nitens.*

Appletoniana. Lvs. to 6 in. long and 1½ in. wide: fls. solitary on stalks to 20 in. high, about 4 in. across; sepals yellow-green; petals green at base and rose at tip; lip greenish-brown, spring. Siam.

Argus. Lvs. to 7 in. long and 1½ in. wide: fls. solitary on stalks to 16 in. high; sepals white veined with dark color; petals red at tip; lip dark purple marked with light green, Apr.–July. Philippine Isls.

Arthuriana. Hybrid between *C. insignis* and *C. Fairieana.*

Ashburtonæ. Hybrid between *C. barbata* and *C. insignis.*

augusta. Hybrid between *C. Haynaldiana* and *C. villosa.*

aurea. Hybrid between *C. nitens* and *C. Spiceriana.* There are many named forms of this hybrid.

barbata. Lvs. to 6 in. long and 1 in. wide: fls. to 4 in. across, solitary on stalks to 10 in. high; sepal white or pale green veined with red-brown; petals greenish and purple at tip with black warts; lip brown-purple, Apr.–Aug. Malaya.

Beeckmani. Hybrid between *C. bellatula* and *C. villosa* var. *Boxallii.*

bellatula. Lvs. to 6 in. long and 1½ in. wide, purple beneath: fls. 2 in. across, solitary on short stalks, white spotted with purple, in spring. Burma.

Boxallii: *C. villosa* var.

Bragaiana: *C. Godseffiana.*

Brandtiæ. A cross between two hybrids, *C. Iva* and *C. Youngiana.*

Bruniana. Hybrid between *C. Leeana* and *C. œnantha.*

callo-Rothschildiana: *C. Fowleri.*

callosa. Lvs. to 10 in. long and 2 in. wide: fls. about 4 in. across, solitary on stalks to 1 ft. high; sepal white lined with purple; petals greenish, purple at tip; lip brown-purple, Mar.–July. Siam, Cochin-China. Var. **gigantea** has sepal shaded with emerald-green. Var. **Sanderæ** has white fls. lined with green.

Calypso. Hybrid between *C. villosa* var. *Boxallii* and *C. Spiceriana.*

Canhami. Hybrid between *C. superbiens* and *C. villosa.*

Chamberlainiana. Lvs. to 1 ft. long and 2 in. wide: fls. to 4 in. across, in 4–8-fld. racemes to 16 in. long; sepal greenish marked with brown; petals greenish-rose with small brown spots, twisted and wavy; lip green spotted with red. Sumatra.—Blooms all year.

Charlesiana. Hybrid between *C. nitens* and *C. Leeana.*

Charlesworthii. Lvs. to 10 in. long and 1 in. wide: fls. 2½ in. across, solitary on stalks to 6 in. high; sepal rose; petals and lip greenish marked with brown, Sept.–Oct. Bengal.

ciliolaris. Lvs. to 6 in. long and 2 in. wide: fls. 3 in. across, solitary on stalks to 10 in. high; sepal white striped with green and brown at base; petals drooping, reddish with dark purple spots; lip greenish-brown, Apr.–June. Philippine Isls.

Clarki. Hybrid between *C. Charlesworthii* and *C. Swaniana.*

concolor. Lvs. to 6 in. long and 1½ in. wide: fls. 3 in. across, solitary on stalks to 4 in. high, bright yellow finely spotted with violet, May–June. Siam, Burma.

Crossiana. Hybrid between *C. insignis* and *C. venusta.*

Curtemanni. A cross between two hybrids, *C. Schlesingeriana* and *C. Beeckmani.*

Curtisii. Lvs. to 8 in. long and 3 in. wide: fls. to 4 in. across, solitary on stalks to 8 in. high; sepal green edged with white and lined with purple; petals greenish-rose finely spotted with dark purple; lip greenish-brown, Apr.–July. Sumatra.

Cymatodes. Hybrid between *C. Curtisii* and *C. superbiens.*

Dauthieri: *C. Harrisiana.*

Dayana. Lvs. to 7 in. long and 2 in. wide: fls. to 6 in. across, solitary on stalks to 10 in. high; sepal white, lined with green; petals white lined with red-brown; lip greenish-violet, May–June. Borneo.

Deedmaniana. Hybrid between *C. Chamberlainiana* and *C. Spiceriana.*

Dicksoniana. Cross between *C. Hera* (hybrid) and *C. villosa.*

Druryi. Lvs. to 10 in. long and 1½ in. wide: fls. to 3 in. across, solitary on stalks to 10 in. high, golden-yellow with a dark red stripe on dorsal sepal, in spring. India.

Edwardi. Hybrid between *C. Fairieana* and *C. superbiens.*

enfieldensis. Hybrid between *C. Lawrenceana* and *C. Hookeræ.*

exul. Lvs. to 10 in. long and ¾ in. wide: fls. 3 in. across, solitary on stalks to 5 in. high; sepal green edged with white and spotted brown; petals yellow lined with purple; lip yellow, June–July. Siam.

Fairieana. Lvs. to 6 in. long and 1 in. broad: fls. about 3 in. across, solitary on long st.; sepals greenish and striped violet; petals green and violet; lip white at base, green at top. E. Himalayas.

Fowleri (*C. callo-Rothschildiana*). Hybrid between *C. callosa* and *C. Rothschildiana.*

fulshawensis: *C. Schlesingeriana.*

Germinyana. Hybrid between *C. hirsutissima* and *C. villosa.*

gigas (*C. Prewetti*). Hybrid between *C. Lawrenceana* and *C. Harrisiana.*

glaucophylla. Lvs. to 10 in. long and 1½ in. wide: fls. many, on stalks to 16 in. high; sepal whitish-yellow, green at base; petals twisted, thickly spotted with red; lip dull violet. Java.—Blooms all year.

Godefroyæ. Lvs. to 6 in. long and 1¼ in. broad, marbled: fls. white or pale yellow, sparingly pubescent; lip small, spotted. Cochin-China.

Godseffiana (*C. Bragaiana*). Hybrid between *C. villosa* var. *Boxallii* and *C. hirsutissima.*

Gratrixiana. Hybrid between *C. bellatula* and *C. enfieldense.*

Grovesiana. Hybrid between *C. Lathamiana* and *C. Leeana.*

Hanseni. Hybrid between *C. Haynaldiana* and *C. villosa.*

Harrisiana (*C. Dauthieri. C. hybrida*). Hybrid between *C. villosa* and *C. barbata.*

Harveyana. Hybrid between *C. Stonei* and *C. Leeana.*

Haynaldiana. Lvs. to 10 in. long and 1 in. wide: fls. to 6 in. across, in 2–6-fld. racemes to 20 in. high; sepals and petals rose, green at base and with large brown spots at tip; lip greenish marked with brown. Philippine Isls.

hirsutissima. Lvs. to 6 in. long and ¾ in. wide: fls. 4½ in. across, solitary on stalks to 8 in. high; sepal green marked with violet; petals green at base and violet at tip, spotted with brown; lip brown marked with violet, Apr.–June. India.

Hitchensiæ. Hybrid between *C. Charlesworthii* and *C. insignis.*

Hookeræ. Lvs. to 1 ft. long and 1½ in. wide: fls. 4 in. across, solitary on stalks to 1 ft. high; sepal yellow-green; petals green at base, rose at tip, spotted with red; lip green marked with brown, Apr.–June. Borneo.

Horniana. Hybrid between *C. Spiceriana* and *C. superbiens.*

hybrida: *C. Harrisiana.*

ingens. Hybrid between *C. insignis* and *C. Rothschildiana.*

insignis. Lvs. to 10 in. long and 1 in. wide: fls. to 4 in. across, solitary on stalks to 8 in. high; sepal white at tip, yellow-green at base, spotted with brown; petals and lip yellow-green veined with brown, Oct.–Mar. Himalayas.—Runs into many named forms, a few of which are: **Amesiana** with unspotted fls. and sepal with broad white margin; **Balliæ**; **brugensis**; **Chantini** with deeper coloring and larger white area on sepal; **Cobbiana**; **corrugata** with corrugated lip; **Coulsoniana** with larger fls.; **Dominaiana**; **Edeniana**; **Ernesti** with yellow fls., the sepal brown spotted; **Fostermanni**, sepal with broad white border; **gigantea**; **Gravesiana**, sepal with broad white border and brown spots arranged in regular lines; **heatonensis**; **Hurrelliana**, sepal greenish-yellow, reddish-brown at base and tipped with white; **immaculata nigra**; **Lageræ**, sepal dark brown in center margined with white; **Leopardina**; **Lindeniæ**; **Luciani** with bright yellow fls. tinged green and sepal with broad white border; **luteo-alba** has sepal two-thirds white, yellowish-green at base; **Macfarlanei**, with clear yellow fls. and sepal with broad white border; **maxima** with large deep green sepal; **punctatissima** has the sepal covered with brown spots; **rutherfordensis**; **Sadleri**; **Sanderæ** with bright yellow fls. white at tips; **Sanderiana** with yellowish-green fls. veined with dark green, sepal with broad white border; **sylhetensis**, sepal with large dark spots; **Watsoni**; **westgatensis**; **xanthina**; **Youngiana**; **zebrina**.

javanica. Lvs. to 6 in. long and 2 in. wide: fls. to 5 in. across, solitary on stalks to 1 ft. high, green, the sepal veined with dark green, July–Sept. Java.

Josephiana. Hybrid between *C. Druryi* and *C. Sementa.*

Kamili. Hybrid between *C. villosa* var. *Boxallii* and *C. Chamberlainiana.*

lævigata: *C. philippinensis.*

Lairessei. Hybrid between *C. Curtisii* and *C. Rothschildiana.*

Lathamiana (*C. Thompsoni*). Hybrid between *C. Spiceriana* and *C. villosa.*

Lawrenceana. Lvs. to 6 in. long and 2 in. wide: fls. to 3 in. across, solitary on stalks to 1 ft. high; sepal white veined with violet-red; petals bright green tipped with purple-brown; lip brown-purple, in spring and summer. Borneo. Var. **Hyeana** has white sepals and petals marked with green and olive-green lip.

Leeana. Hybrid between *C. insignis* and *C. Spiceriana.* There are many named forms of this hybrid.

Leonæ. Hybrid between *C. insignis* and *C. callosa.*

longwoodense. Hybrid between *C. Charlesworthii* and *C. Leeana.*

Lowii: form of *C. bellatula.*

lurida. Hybrid between *C. Lawrenceana* and *C. villosa* var. *superba.*

Mabeliæ. Hybrid between *C. superbiens* and *C. Rothschildiana.*

macroptera. Hybrid between *C. Lowii* and *C. superbiens.*

Mahleræ. Hybrid between *C. Rothschildiana* and *C. Lawrenceana.*

Mastersiana. Lvs. to 8 in. long and 2 in. wide: fls. 4 in. across, solitary on stalks to 16 in. high; sepals green with brighter margins; petals brown; lip copper-brown, Apr.–July. Malaya.

Matthewsi. Hybrid between *C. Lawrenceana* and *C. Mastersiana.*

Maudiæ. Hybrid between *C. Lawrenceana* var. *Hyeana* and *C. callosa* var. *Sanderæ.*

Morganiæ. Hybrid between *C. Stonei* and *C. superbiens.*

nitens (*C. Sallieri*). Hybrid between *C. villosa* and *C. insignis* var. *Maulei.*

nivea. Lvs. to 6 in. long and 1½ in. wide, purple beneath: fls. to 3 in. across, solitary on stalks to 5 in. high, white spotted with red, Apr.–Aug. Malaya.

œnantha. Hybrid between *C. Harrisiana* and *C. insignis* var. *Maulei.*

Osbornei: *C. Savangeana.*

Parishii. Lvs. to 1 ft. long and 2 in. wide: fls. 3 in. across, in 3–7-fld. racemes to 2 ft. high, yellow-green, the petals spotted with brown, Apr.–Aug. Burma.

philippinensis (*C. lævigata*). Lvs. to 1 ft. long and 1½ in. wide: fls. 2 in. across, in 3–5-fld. racemes to 2 ft. high; sepal yellow veined with violet; petals brown-violet; lip yellow veined with green, July–Sept. Philippine Isls.

Polletiana. Hybrid between *C. calophylla* and *C. œnantha* var.

Prewetti: *C. gigas.*

purpurata. Lvs. to 4 in. long and 1½ in. wide: fls. solitary on stalks to 6 in. high; sepal white striped purple; petals green at base, purple; lip red-brown, June–Sept. China.

regalis. Hybrid between *C. purpurata* and *C. insignis* var. *Maulei.*

Rolfei magnifica. Hybrid between *C. bellatula* and *C. Rothschildiana.*

Rothschildiana. Lvs. to 2 ft. long and 1½ in. wide: fls. 5 in. across, in 2–5-fld. racemes to 2½ ft. high; sepal yellow lined with dark purple; petals green spotted with red-purple, wavy; lip dark purple tipped with yellow, July–Sept. Sumatra, Borneo.

Sallieri: *C. nitens.*

Sanderi. A cross between two hybrids, *C. Calypso* and *C. nitens.*

Sanderiana. Lvs. to 1 ft. long and 1½ in. wide: fls. in 3–5-fld. racemes to 2 ft. high; sepal yellow, green at base, with broad purple stripes; petals yellow tipped with red-brown and edged with red; lip brown-purple, July–Sept. Philippine Isls.

Savangeana (*C. Osbornei*). Hybrid between *C. Harrisiana* and *C. Spiceriana.*

Schlesingeriana (*C. fulshawensis*). Hybrid between *C. villosa* var. *Boxallii* and *C. insignis* var. *Maulei.*

Selligera. Hybrid between *C. barbata* and *C. philippinensis.*

Simoni (*C. Actæus*). Hybrid between *C. Leeana* and *C. insignis* var. *Sanderæ.*

Spiceriana. Lvs. to 10 in. long and 1 in. wide: fls. 2 in. across, solitary on stalks to 8 in. high; sepal snow-white with a purple band in center; petals greenish-brown, wavy-margined; lip violet-brown edged with green, Oct.–Feb. India.

Stevensi. Cross between the hybrids *C. Calypso* and *C. Lathamiana.*

Stonei. Lvs. to 16 in. long and 1 in. wide: fls. 5 in. across, in 3–5-fld. racemes to 2 ft. high; sepal white striped with purple; petals yellow spotted with brown; lip yellow below, above bright brown or rose, July–Oct. Borneo.

superbiens. Lvs. to 6 in. long and 2 in. wide: fls. 3½ in. across, solitary on stalks to 10 in. high; sepal white lined with green; petals whitish lined with green and spotted with purple-brown; lip brown-purple, Mar.–July. Malaya.

superciliaris. Hybrid between *C. barbata* and *C. superbiens.*

Swaniana. Hybrid of *C. barbata* and *C. Dayana.*

Swinburnei magnifica. Hybrid between *C. insignis* var. *Maulei* and *C. Argus.*

Thompsoni: *C. Lathamiana.*

tonsa. Lvs. to 6 in. long and 1½ in. wide: fls, to 5 in. across, solitary on stalks to 10 in. high; sepal white or greenish striped with red; petals bright green veined with darker, red at tip; lip greenish shaded with brown, Mar.–July. Sumatra.

triumphans. Hybrid between *C. nitens* and *C. œnantha.*

Truffautiæ. Hybrid between *C. ciliolaris* and *C. Stonei.*

venusta. Lvs. to 6 in. long and 1½ in. wide, purple beneath: fls. 3 in. across, solitary on stalks to 6 in. high; sepal whitish striped with green; petals brownish, at base reddish or greenish; lip yellow-green marked with red and green, Nov.–Jan. Himalayas.

vexillaria. Hybrid between *C. barbata* and *C. Fairieana.*

Victoriæ-Mariæ. Fls. to 4 in. across; sepal green lined with red-brown; petals green edged with red; lip purple-brown, Apr.–July. Sumatra.

villosa. Lvs. to 16 in. long and 1½ in. wide: fls. 6 in. across, solitary on stalks to 1 ft. high; sepal olive-brown edged with white; petals brownish-yellow, wavy-margined; lip brownish-yellow with lighter veins, Nov.–May. Burma. Var. **Boxallii** has sepal spotted with dark brown.

CORDYLINE. DRACENA. *Liliaceæ.* Trees or shrubs with leathery or stiff narrow lvs. usually crowded at top of branches, often variegated, and greenish or yellowish fls. in panicles on solitary pedicels; grown under glass and out-of-doors in warm climates for the foliage; often more or less palm-like in appearance. *C. terminalis* has foliage in many color combinations. See *Dracæna.*

Propagated by seeds, cuttings and root-layering. The leaves may be removed from ripened stems, these stems cut into 2–4-inch lengths and laid in sand in propagating bed with bottom heat. When the eyes have developed growth of about six leaves, the shoots should be cut off with an eye and put in propagating-bed until rooted and then transplanted into pots.

amabilis. A form of *C. terminalis* having shining deep green lvs. becoming spotted with rose and white.

australis (*Dracæna australis*). To 40 ft.: lvs. to 3 ft. long and 2½ in. across: fls. white, fragrant, in large terminal panicles. New Zeal. Var. **atropurpurea** has base of lf. and midrib beneath purple. Var. **Veitchii** is bright crimson on midrib and base of lf.

Banksii. To 10 ft.: lvs. to 6 ft. or more long and 3½ in. across: fls. white, in drooping much branched panicles to 5 ft. long. New Zeal.

Baptistii. A form of *C. terminalis* having deep green lvs. striped with pink and yellow.

Bruantii. A garden form of *C. rubra.*

cannæfolia. A var. of *C. terminalis* with oblanceolate lvs. about 1 ft. long.

congesta: *C. stricta.*

Doucetii. A form of *C. australis* having lvs. edged and striped with white.

hybrida. A form of *C. terminalis* having deep green lvs. margined with rose.

imperialis. Lvs. deep metallic green marked with crimson or pink; form of *C. terminalis.*

indivisa (*Dracæna indivisa*). To 25 ft.: lvs. to 6 ft. long and 6 in. wide: fls. white, in drooping panicles to 4 ft. long. New Zeal.

metallica. A form of *C. terminalis* becoming purple-bronze in age.

nigro-rubra. Lvs. narrow, dark brown with rosy centers; form of *C. terminalis.*

norwoodiensis. A *terminalis* variant having lvs. striped with yellow, green and crimson.

pumilio. Stemless or with st. to 3 ft.: lvs. to 3 ft. long and ⅔ in. across: fls. white or bluish, in slender panicles to 3 ft. long. New Zeal.

Robinsoniana. Lvs. light green striped with bronze and brownish-crimson; form of *C. terminalis.*

rubra. To 15 ft.: lvs. to 15 in. long and 2 in. across: fls. lilac, in nodding lateral panicles. Country unknown.

stricta (*C. congesta*). To 12 ft.: lvs. to 2 ft. long and 1¼ in. across: fls. lilac, in terminal or lateral panicles. Australia. Var. **grandis** is a large highly colored form.

terminalis. To 10 ft.: lvs. to 2½ ft. long and 5 in. across: fls. yellowish, white or reddish, in panicles to 1 ft. long. E. Asia.—Runs into many foliage forms, and some of them have been given Latin names as if species.

tricolor: color form of *C. terminalis.*

Youngii. A form of *C. terminalis* with bright green lvs. streaked with red, bronze in age.

COREMA. *Empetraceæ.* Evergreen heath-like small shrubs with diœcious fls. in terminal heads, without sepals or petals; native in N. Amer. and Eu. Propagated by cuttings.

Conradii. BROOM CROWBERRY. To 2 ft.: lvs. linear, to ¼ in. long: staminate fls. with long purple stamens. Newf. to N. J. in rocky and sandy places.—Useful for colonizing and for ground-cover.

COREOPSIS (*Calliopsis. Leptosyne*). TICKSEED. *Compositæ.* Ann. and per. herbs, seldom shrubby, with mostly opposite lvs. that are entire or variously lobed or cut: heads solitary or loosely panicled, yellow, brown or rose, blooming in summer and autumn, of ray- and disk-fls.; pappus of teeth or scales or none. Grown in the flower-garden and border.

Coreopsis grows well in any garden soil. The annuals are started from seed sown indoors in early spring or in the open when the ground is warm, the perennials from seed, or by cuttings of growing wood in summer, and by division. The annual kinds are well-known flower-garden subjects, as *C. Atkinsoniana, Drummondii, tinctoria.* See *Thelesperma.*

Atkinsoniana. Ann. or per. to 4 ft.: lvs. 1–2-pinnate into linear lobes: heads to 1½ in. across, on long stalks, rays with brown-purple base, toothed or lobed, disk purple or brownish: achenes narrow-winged. B. C. to N. D.

atrosanguinea. A flower-garden ann., probably *Thelesperma Burridgeanum.*

auriculata. Per. to 1½ ft.: lvs. oval, simple or with few basal lobes: heads 2 in. across, rays yellow, toothed: achenes narrow-winged. Va. to Fla.—*C. auriculata* of the trade is *C. pubescens.*

bicolor: *C. tinctoria.*

calliopsidea (*Leptosyne calliopsidea*). Ann. to 2 ft. or less, sts. leafy: lower lvs. narrow or ligulate, the upper ones pinnately parted; heads to 3 in. across; pappus of scales. Calif., on moist hillsides.

cardaminefolia. Ann. to 2 ft.: lvs. 1–2-pinnate into ovate to linear lobes: heads about 1 in. across, rays brown-purple at base, toothed, disk dark purple: achenes winged. Kans. to Ariz.

coronata (*C. nuecensis* in part). Ann., glabrous or sparsely pubescent, branched, to 2 ft.: lvs. obovate or spatulate-oblong, to 3 in. long, entire or lower ones 3-parted: rays yellow, dark-lined, the heads to 2 in. across. Tex.

delphinifolia. LARKSPUR C. Per. to 5 ft.: lvs. to 3 in. long, palmately 3-parted and middle segm. again cut into linear lobes: heads to 2½ in. across, disk purple-brown, rays yellow, entire: achenes narrowly winged. Va. to Ga. and Ala.

Douglasii (*Leptosyne Douglasii. L. californica*). Ann. to about 1 ft.: lvs. all basal, filiform to linear and entire or pinnately parted: heads 1¼ in. across; pappus none or a little cup. S. Calif., Ariz.

Drummondii (*C. picta*). GOLDEN-WAVE. Ann. to 2 ft.: lvs. pinnate into ovate to linear lobes: heads to 2 in. across, long-stalked, rays yellow, brownish-purple at base, toothed or lobed, disk dark purple: achenes with thick margin. Tex.

elegans: *C. tinctoria.*

floribunda: *C. grandiflora.*

gigantea (*Leptosyne gigantea*). Succulent shrub to 6 ft., leafy only towards top: lf.-divisions nearly or quite filiform: heads to 3 in. across, on clustered peduncles 3–6 in. long; pappus none. Coasts, S. Calif.

grandiflora (*C. floribunda. C. lanceolata* var. *grandiflora*). Per. to 2 ft.: lvs. narrow and entire but mostly 3–5-parted: heads to 2½ in. across, on long stalks, rays yellow, lobed, disk yellow: achenes with broad wings. Ga. to New Mex.

lanceolata. Per. to 2 ft.: lvs. usually entire, mostly near the base: heads to 2½ in. across, very long-stalked, rays yellow, lobed, disk yellow: achenes broad-winged. Ont. to Fla. and La. Var. **flore-pleno** has double fls.

major (*C. senifolia*). Per. to 3 ft.: lvs. lanceolate and entire or palmately cut into 3 lanceolate segms.: heads to 2 in. across, rays yellow, entire, disk yellow: achenes winged. Va. to Fla. and Ala.

maritima (*Leptosyne maritima*). SEA-DAHLIA. Per. to 3 ft., sts. leafy and hollow: lf.-divisions linear or broader: heads to 3½ in. across, solitary on sts. to 1 ft. long; pappus none. Coasts, S. Calif.

marmorata: *C. tinctoria.*

nigra: *C. tinctoria* var. *atropurpurea.*

nuecensis: see *C. coronata.*

oculata: hort. name.

palmata. FINGER C. Per. to 3 ft.: lvs. palmately 3-cleft to below middle: heads to 2½ in. across, rays bright yellow, toothed, disk yellow: achenes narrow-winged. Ind. to Neb. and La.

picta: *C. Drummondii.*

pubescens. Per. to 4 ft.: lvs. oval, entire or with small lateral lobes: heads to 2½ in. across, rays yellow, lobed, disk yellow: achenes winged. Va. to Fla. and La.

radiata: hort. name for a form with rolled-up ray-fls.

rosea. Per. to 2 ft. with slender creeping rootstocks: lvs. linear, entire or 3-parted: heads to 1 in. across, short-stalked, rays rose-color, slightly toothed, disk yellow: achenes not winged. Mass. to Ga.

senifolia: *C. major.*

Stillmanii (*Leptosyne Stillmanii.*) Ann. to 1 ft., slightly fleshy, sts. leafy: lvs. with long linear lobes: heads 1½ in. or more across; pappus a cup. Calif.

tenuifolia: *C. verticillata.*

tinctoria (*C. bicolor. C. elegans. Calliopsis marmorata*). Ann. to 3 ft.: lvs. divided into lanceolate or linear segms.: heads to 2 in. across, long-stalked, rays yellow, crimson-brown at base, toothed, disk brownish-purple: achenes wingless. Minn. to Neb. and Ariz. Var. **atropurpurea** (*C. nigra*) has rays crimson-brown throughout. Var. **flore-pleno** has double fls. Var. **nana** is dwarf.

trichosperma: *Bidens trichosperma.*

tripteris. Per. to 8 ft.: lvs. lanceolate and entire or lower 3-parted: heads 1½ in. across, rays yellow, entire, disk yellow: achenes narrow-winged. Ont. to Fla. and La.

verticillata (*C. tenuifolia*). Thread-leaf C. Per. to 3 ft.: lvs. ternately divided into thread-like segms.: heads to 2 in. across, rays deep yellow, entire, disk yellow: achenes narrow-winged. Md. to Ark. and Neb.

CORETHROGYNE. *Compositæ.* A few per. herbs of Calif., somewhat like Aster and differing in technical characters, the herbage cottony-white when young: lvs. sessile, entire or serrate: heads with yellow disk and rays in the purple series.

californica. To 1½ ft. high, the sts. prostrate or decumbent at base and then ascending: lvs. linear to spatulate or obovate, the lowest few-toothed: heads solitary on peduncles, to ⅓ in. high, rays purple to lilac.

CORIACEOUS: leathery, as of leaves that are thick and stiff.

CORIANDER: *Coriandrum sativum.*

CORIANDRUM. *Umbelliferæ.* Ann. herbs with pinnately compound lvs., small white fls. in compound umbels, and ovoid frs.; one species grown for the frs. or seeds which are used as seasoning. It is of easy cult. in any garden soil. Propagated by seeds sown in autumn or spring, the latter time in the N.

sativum. Coriander. To 3 ft., strong-smelling: lvs. decompound, the upper divided into narrowly linear segms., the lower lvs. with ovate deeply cut segms. S. Eu.

CORIARIA, the only genus in the family *Coriariaceæ.* Herbs or shrubs with opposite or whorled lvs., small greenish fls. in racemes, with 5 sepals and 5 petals, 10 stamens, superior ovary, and berry-like fr.; the following species grown in S. U. S. and Calif. Propagated by seeds, cuttings of green wood, suckers and layers.

japonica. Shrub to 6 ft. or more: lvs. ovate to ovate-lanceolate, to 4 in. long, acute, 3-nerved: fls. greenish or reddish, in racemes: fr. red to blackish. Japan; hardy south of Washington.

myrtifolia. Shrub to 10 ft.: lvs. ovate, to 2½ in. long: racemes 1 in. long: fr. black. S. Eu., N. Afr.

ruscifolia (*C. sarmentosa*). Shrub or small tree to 25 ft.: lvs. ovate, to 3 in. long: racemes to 1 ft. long, drooping: fr. purple-black. New Zeal.

sarmentosa: *C. ruscifolia.*

terminalis. Herb or subshrub to 3 ft.: lvs. ovate, to 3 in. long: racemes 10 in. long: fr. black. China.

CORKSCREW-FLOWER: *Phaseolus Caracalla.*

CORK-TREE: *Phellodendron.*

CORM: a solid bulb-like part, usually subterranean, as the "bulb" of crocus and gladiolus.

CORMEL: a corm arising from a mother-corm.

CORN as a horticultural subject implies sweet or sugar maize (*Zea Mays* var. *rugosa*) as distinguished from the field or agricultural corns, and also certain kinds grown for the striped ornamental foliage.

Sweet corn, grown for the edible immature ear, is a tender annual, requiring warm "quick" land and full sun exposure. The first planting should be made in the home garden as soon as frost is past. It is well to plant early, intermediate and late varieties at the same time, then at intervals of two weeks until early summer, thus having a succession from the first crop until October. For late crop, corn may be started in pots and transplanted when peas and other crops are off. The soil for corn should be fertile, and the coarser manure left from the preparation of the ground for small crops may be used to good advantage. Corn for the garden is better planted in drills, the drills 3 to 4 feet apart, dropping the seed 10 to 12 inches apart in the drills. Some gardeners prefer to plant in "hills" 2–3 feet apart, of 3–5 stalks each. One quart of seed will plant 200 hills. Give frequent tillage. Golden Bantam (8-rowed) is now the leading variety for the home table, but Evergreen is popular and a good market kind. Some of the "green corn" in markets is not sweet corn.

Pop corn (*Z. Mays* var. *everta*) is grown the same as sweet corn.

CORNACEÆ. Dogwood Family. Shrubs and small trees, sometimes practically herbaceous, of about 10 genera most abundant in the northern hemisphere, having simple lvs., small bisexual or diœcious fls. sometimes surrounded by a showy corolla-like involucre, with 4–5-lobed calyx, 4–5 petals or none, 4–5 stamens, inferior 1–4-celled ovary, and fr. a drupe or berry. The genera Aucuba, Cornus, Corokia, Griselinia, Helwingia, are grown for ornament.

CORN, BROOM-: *Holcus Sorghum* var. *technicus.* **Chicken-:** *Holcus Sorghum* var. *Drummondii.* **Cockle:** *Agrostemma.*

CORNFLAG: *Gladiolus segetum.*

CORNFLOWER: *Centaurea Cyanus.*

CORN-SALAD: *Valerianella.*

CORNUS. Dogwood. *Cornaceæ.* Mostly shrubs and small trees with simple entire usually opposite and mostly deciduous lvs., small white or greenish-white fls. in a terminal infl., and little drupaceous frs., sometimes with large showy involucre like a corolla.

Dogwoods are useful for shrubberies and sometimes as single specimens. They are of easy cultivation in any usual soil. Propagated by cuttings of mature wood, layers, or varieties by budding and grafting on common stocks. The following species are hardy in the North unless otherwise stated.

alba. Tatarian D. To 10 ft., with blood-red branches: lvs. ovate or elliptic, to 5 in. long, glaucous below: fls. in cymes to 2 in. across: fr. whitish or tinted blue. Siberia, N. China. Var. **argenteo-marginata** (*elegantissima variegata*) has lvs. edged with white. In var. **Gouchaultii** the lvs. are variegated with yellowish-white and pink. Var. **sibirica** (*C. sibirica*) has bright coral-red branches. In var. **Spaethii** the lvs. are broadly edged with yellow.

alternifolia. Pagoda D. To 25 ft.: lvs. alternate, oval or ovate, to 4 in. long, pale beneath: fls. in cymes about 2½ in. across: fr. dark blue, rarely yellow. N. S. to Ga. and Mo.

Amomum (*C. sericea. C. cærulea*). Silky D. To 10 ft., with purplish branches: lvs. ovate to ovate-lanceolate, to 4 in. long, usually silky-pubescent beneath: fls. in cymes to 2½ in. across: fr. pale blue. Newf. to Fla. and Tex.

asperifolia. Rough-leaved D. To 15 ft., with reddish-brown branches: lvs. ovate to oval, to 4 in. long, rough above and pale beneath: fls. in cymes to 3 in. across: fr. white. Ont. to Fla. and Tex.

australis. Branches purplish or greenish: lvs. ovate, to 3 in. long, rough and hairy beneath: fls. in small dense cymes: fr. purplish-black. W. Asia.

Baileyi. To 10 ft., with reddish branches: lvs. ovate to lanceolate, to 5 in. long, white beneath: fls. in cymes to 2 in. across: fr. white. Ont. and Pa. to Minn., mostly on shores.

brachypoda: *C. macrophylla.*

cærulea: *C. Amomom.*

canadensis (*Chamæpericlymenum canadense*). Bunchberry. Woody per. herb to 9 in.: lvs. whorled, oval to obovate, to 3 in. long: fls. in dense heads subtended by an involucre of 4–6 large white petal-like bracts: fr. bright red. Newf. to Alaska, south to W. Va., and E. Asia.

capitata (*Benthamia fragifera*). To 40 ft., partially evergreen: lvs. leathery, oval-lanceolate, to 4 in. long: fls. in dense heads subtended by 4–6 large creamy-white petal-like bracts: fr. scarlet. Himalayas; to be grown only far S.

circinata: *C. rugosa.*

coloradensis: *C. stolonifera* var.

controversa. To 60 ft.: lvs. alternate, ovate, to 5 in. long, whitish beneath: fls. in cymes to 4 in. across: fr. bluish-black. Himalayas to Japan. Var. **variegata** has lvs. edged with white.

Dunbarii. Hybrid between *C. asperifolia* and *C. macrophylla*: lvs. ovate, to 6 in. long: fls. in corymbs to 2½ in. across: fr. blue.

femina (*Cornus* and *Svida stricta*). To 15 ft., with purplish branches: lvs. ovate to ovate-lanceolate, to 3 in. long: fls. in cymes to 2½ in. across: fr. pale blue. Va. to Fla. and Tex.; not hardy far N.

florida (*Cynoxylon floridum*). Flowering D. To 40 ft.: lvs. ovate, to 6 in. long: fls. in dense heads subtended by 4 large white petal-like bracts: fr. scarlet. Me. to Fla. and Tex. Var. **pendula** has drooping branches. Var. **plena** has double fls. In var. **rubra** the bracts are pink or rose.

Hemsleyi. To 12 ft.: lvs. ovate, to 3 in. long, hairy and pale beneath: fr. bluish-black. China; not hardy N.

Kousa (*Benthamia japonica*). Kousa. To 20 ft.: lvs. ovate, to 4 in. long, glaucous beneath: fls. in dense heads subtended by creamy-white petal-like bracts: frs. grown together into a head. Japan, China.

macrophylla (*C. brachypoda*). To 50 ft.: lvs. elliptic-ovate, to 6 in. long, glaucous beneath: fls. in panicle-like cymes to 6 in. across: fr. bluish-black. Himalayas, China, Japan; to be planted in north-central regions.

mas (*C. mascula*). Cornelian-Cherry. To 20 ft.: lvs. ovate, to 4½ in. long: fls. yellow, before the lvs., in umbels about ¾ in. across: fr. scarlet, edible. S. Eu., Orient. In var. **aureo-elegantissima** the lvs. are variegated with pink or yellow.

mascula: *C. mas.*

Nuttallii. To 75 ft.: lvs. ovate to obovate, to 5 in. long, glaucous beneath: fls. in dense heads subtended by white or pinkish bracts: fr. red or orange. B. C. to S. Calif.; hardy only far S.

obliqua. To 10 ft., the branches purple or yellowish-red: lvs. ovate to oblong, to 3 in. long, glaucous beneath: fls. in cymes 2 in. across: fr. blue to nearly white. Que. to Kans.

officinalis. To 15 ft.: lvs. elliptic, pale beneath: fls. before lvs., in umbels to about ¾ in. across: fr. scarlet. Japan, China.

paniculata: *C. racemosa.*

paucinervis. To 6 ft.: lvs. narrowly oval, to 4 in. long, more or less persistent: fls. in cymes to 3½ in. across: fr. black. China; hardy in north-central parts.

pubescens (*Svida pubescens*). To 18 ft., the branches purple: lvs. elliptic, to 4 in. long, tomentose and glaucous beneath: fls. in cymes 2 in. across: fr. white. B. C. to Calif; not hardy N.

racemosa (*C. paniculata*). To 15 ft.: lvs. ovate-lanceolate or lanceolate, to 4 in long, pale beneath: fls. in panicles: fr. white. Me. to N. C. and Neb.

rugosa (*C. circinata*). To 10 ft.: lvs. broadly ovate or orbicular, to 6 in. long, pale and pubescent beneath: fls. white, in dense cymes to 2½ in. across: fr. light blue. N. S. to Va. and N. D.

sanguinea. Bloodtwig D. To 12 ft., with purple or red branches: lvs. ovate, to 3 in. long: fls. in cymes to 2 in. across: fr. black. Eu., Orient. Var. **variegata** has lvs. variegated with yellowish-white. In var. **viridissima** the branches and fr. are green.

sericea: *C. Amomum.*

sibirica: *C. alba* var.

stolonifera. Red-Osier D. To 10 ft., with dark red branches, spreading by underground sts.: lvs. ovate or ovate-lanceolate, to 5 in. long: fls. in cymes to 2 in. across: frs. white or bluish. N. Amer. Var. **coloradensis** has brownish-red branches and bluish fr. Var. **flaviramea** has yellow branches.

stricta: *C. femina.*

utahensis: listed name.

COROKIA. *Cornaceæ.* Evergreen shrubs or trees native in New Zeal., with alternate entire small lvs., small yellow axillary fls. usually clustered, and drupaceous frs.; grown out-of-doors in Calif.

buddleoides. To 12 ft., much branched: lvs. lanceolate or linear-lanceolate, to 6 in. long, white-tomentose beneath: fls. in terminal panicles: fr. dark red. Var. **linearis** has narrower lvs.

Cotoneaster. To 10 ft., the branches numerous and interlaced: lvs. ovate, to 1 in. long, white-tomentose beneath: fr. red.

macrocarpa. To 20 ft.: lvs. oblong, to 4 in. long, white-tomentose beneath: fr. dark red.

COROLLA: inner circle of floral envelopes; if the parts are separate, they are petals; if not separate, they are teeth, lobes or divisions. The corolla is commonly the colored showy part of the flower.

CORONA: crown, coronet; any appendage or intrusion that stands between the corolla and stamens, or on the corolla, as the cup of a daffodil, or that is the outgrowth of the staminal part or circle, as in the milkweeds.

CORONARIA: *Lychnis.*

CORONILLA. *Leguminosæ.* Herbs and shrubs with odd-pinnate lvs., papilionaceous fls. in long-stalked axillary umbels, and cylindrical or angled pods constricted between the seeds; grown out-of-doors and in the greenhouse. Propagated by seeds and division, or by cuttings under glass.

Emerus. Scorpion Senna. Shrub to 9 ft.: lfts. 7–9: fls. yellow, ¾ in. long, the claw of the petals much longer than the calyx: pods 2 in. long. S. Eu.; hardy N.

glauca. Shrub to 4 ft.: lfts 5–7: fls. yellow, ½ in. long, the claw of the petals about length of calyx. S. Eu. Var. **variegata** has variegated foliage.

juncea. Shrub to 3 ft., gray-green, with nearly naked branches: lfts. 3–7: fls. golden-yellow, the claw of petal about length of calyx. Medit. region.

montana. Tall per.: lfts. 11–13: fls. yellow. Caucasus.

Securidaca: *Securigera Coronilla.*

valentina. Shrub to 3 ft.: lfts. 7–13: fls. deep yellow, fragrant. S. Eu.

varia. Crown Vetch. Straggling herb to 2 ft.: lfts. 11–25: fls. pinkish-white, ½ in. long, the claw of petals about length of calyx. Eu.; nat. in northeastern states.

CORONOPUS (*Senebiera*). Wart-Cress. *Cruciferæ.* A few more or less weedy diffuse or procumbent small ann. and bien. herbs with strong odor, sometimes listed, perhaps useful for ground-cover: lvs. commonly pinnatifid: fls. minute, whitish, in little racemes: fr. or silicle very small, twin. C. **procumbens** (*Carara Coronopus*) is tufted and prostrate, glabrous, glaucous, the sts. a few in. long: foliage finely cut: pods crested. Eu.; sometimes escaped.

CORREA. *Rutaceæ.* Australian shrubs or trees with opposite simple lvs., red, white or yellowish-green fls., 4-parted ovary and single style, and fr. of 4 carpels. Marked by the scurfy lvs. and branches.

Grown under glass or in the open in warm regions. Propagated by cuttings, or some species by grafting on *C. alba*. Shoots should be pinched back to induce bushy growth.

alba. To 4 ft.: lvs. orbicular to ovate, white-tomentose beneath: fls. white, bell-shaped, ½ in. long.

bicolor: *C. speciosa.*

speciosa (*C. bicolor*). To 3 ft.: lvs. ovate to lanceolate, white-tomentose beneath: fls. red or yellowish-green, tubular, 1–1½ in. long.

CORTADERIA. Pampas-Grass. *Gramineæ.* Large per. grasses with mostly basal foliage forming great clumps: lvs. rough on edges: spikelets diœcious or sometimes bisexual, borne in panicles which are usually large, plume-like and very decorative; native in S. Amer.; not hardy N. See *Grasses.*

argentea: *C. Selloana.*

jubata: *C. rudiuscula.*

Quila: *C. rudiuscula.*

rudiuscula (*C. Quila. C. jubata. Gynerium jubatum*). To 6 ft.: lvs. to 4 ft. long and ½ in. wide: panicle yellowish or purplish, to 2 ft. long, branches drooping. Ecuador to Chile and Argentina.

Selloana (*C. argentea. Gynerium argenteum*). To 20 ft.: lvs. many ft. long and to ¾ in. wide: panicles white or pink, silky-hairy, to 3 ft. long. Argentina.

CORTUSA. *Primulaceæ.* Per. hairy herbs with long-petioled orbicular lobed lvs. and rose or yellow fls. in umbels terminating the scape; a few species planted in rock-gardens. They do well in any good soil but require winter protection in the N. Propagated by division of roots.

Matthioli. To 6 in.: fls. rosy-purple, nodding. Eu., N. Asia. Var. **pubens** (*C. pubens*) has deeply lobed lvs., the lobes coarsely toothed. Var. **villoso-hirsuta** is hairy with deeply lobed lvs.

pubens: *C. Matthioli* var.

CORYDALIS (*Capnoides*). *Fumariaceæ.* Herbs with pinnately cut lvs., irregular yellow, blue, purple or rose dicentra-like fls. in terminal racemes, and capsular frs.; sometimes grown for ornament. Of easy cult. in any garden soil. Propagated by division or seed; sometimes tuberous-rooted.

bracteata. Per. to 9 in.: fls. sulfur-yellow, 1 in. long. Siberia.

bulbosa. Erect, to 6 in., with solid root: fls. purplish. Eu.

cheilanthifolia. Nearly stemless per. to about 8 in. high: fls. yellow, ½ in. long. China.

glauca: *C. sempervirens.*

lutea. Ann. to 8 in.: fls. pale yellow, ½ in. long. S. Eu.; nat. in England.

montana. Bien. to 1½ ft., glaucous: fls. golden-yellow, to ¾ in. long. S. D. to Mex.

nobilis. Per. to 9 in.: fls. white tipped with yellow and with purple spot, 1 in. long. Siberia.

ochotensis. To 2 ft.: fls. pale violet striped with black at apex, to 1 in. long. Siberia.

ochroleuca. To 1 ft.: fls. yellowish-white with yellow spur. Italy.

ophiocarpa. Ann. or bien. to 3 ft.: fls. yellow. Himalayas.

pallida. To 1½ ft., per.: fls. golden-yellow with brown patch, in racemes. China, Japan.

rosea. Per. to 2 ft.: fls. rose, 1 in. long. China.

rupestris. Per., small, alpine: fls. yellow, with short sac or spur, in simple racemes. Persia.

sempervirens (*C. glauca*). Ann. to 2 ft.: fls. pink tipped with yellow, rarely white, to ¾ in. long. N. Amer.

thalictrifolia. Per. to 1 ft. or more, with woody rootstocks: fls. yellow, 1 in. long. China.

tuberosa. Per. to 6 in., with tuberous roots: fls. purple. Eu.

Wilsonii. Per., with basal rosette of lvs.: fls. canary-yellow, 1 in. long. China.

CORYLOPSIS. Winter Hazel. *Hamamelidaceæ.* Asian deciduous shrubs with alternate toothed strongly veined lvs. and fragrant yellow fls. in nodding racemes before the lvs., caps. with 2 beaks; planted for ornament.

They thrive in a soil of peat and sand, and require protection in the North. Propagated by seeds, by greenwood cuttings under glass and by layers.

Gotoana. To 20 ft.: lvs. to 3 in. long, pubescent on veins beneath: racemes 1 in. long. Japan.

pauciflora. To 6 ft.: lvs. to 3 in. long, glaucous beneath and pubescent on veins: fls. to ¾ in. long, 2–3 together. Japan.

spicata. To 6 ft.: lvs. to 4 in. long. pubescent and glaucous beneath: racemes to 1½ in. long. Japan.

Veitchiana. To 6 ft.: lvs. to 5 in. long, glaucous and glabrous beneath: racemes to 2 in. long. China.

Willmottiæ. To 12 ft.: lvs. to 3 in. long, glaucous and pubescent on veins beneath: racemes to 3 in. long. China.

CORYLUS. Hazelnut. Filbert. *Betulaceæ.* Deciduous monœcious shrubs and small trees native in the north temp. zone, with alternate toothed generally ovate lvs., unisexual fls. before the lvs., the staminate in drooping catkins, and fr. a nut with leafy involucre borne in clusters at ends of branches; grown for ornament and the edible nuts. For cult. see *Filbert.*

americana. American H. To 10 ft.: lvs. to 5 in. long, pubescent beneath: frs. 2–6, the involucre about twice length of nut, with deep irregular lobes. E. N. Amer.

Avellana. European H. To 15 ft.: lvs. to 4 in. long, pubescent beneath: frs. 1–4, the involucre shorter than nut or only slightly longer, with deep irregular lobes. Eu. Hort. vars. are: **aurea**, lvs. yellow; **contorta**, branches twisted; **fusco-rubra** (var. *atropurpurea*, var. *purpurea*), lvs. dull purple or brownish-red; **grandis**, Cobnut, nuts large; **heterophylla** (var. *laciniata*), lvs. pinnately lobed; **pendula**, branches drooping; **quercifolia**, lvs. with broad lobes resembling an oak.

chinensis. Chinese H. To 120 ft.: lvs. to 7 in. long, pubescent: frs. 4–6, the involucre contracted above the nut into a tube, and divided into linear lobes. China.

Colurna. Turkish H. To 80 ft.: lvs. to 5 in. long, pubescent on veins beneath: frs. in clusters, the involucre divided into linear lobes. S. E. Eu., W. Asia.

cornuta (*C. rostrata*). Beaked H. To 10 ft.: lvs. to 4 in. long, pubescent on nerves beneath: frs. 1–2, the tubular bristly involucre much contracted above the nut into a long beak. Que. to Ga. and Mo.

maxima. Filbert. To 30 ft.: lvs. to 5½ in. long: frs. 1–3, the tubular involucre lobed at top and about twice as long as nut. S. E. Eu. Var. **purpurea** has dark purple lvs.

rostrata: *C. cornuta.*

Sieboldiana. Japanese H. Large bush to 15 ft.: lvs. elliptic to obovate, to 4 in. long, hairy on veins underneath: frs. 1–3 in tubular-constricted setose involucre. E. Asia.

CORYMB: short and broad more or less flat-topped indeterminate flower-cluster; outer flowers opening first.

CORYNOCARPUS. The only genus in *Corynocarpaceæ.* Evergreen trees with alternate simple lvs., small bisexual fls. in terminal panicles having 5 sepals and petals, 5 stamens, 5 staminodia, and drupaceous fr. The following species, with poisonous seed (unless steamed, or steeped in salt water) but the pulpy part edible, is planted in Calif. In Melanesia are two other species.

lævigata. To 50 ft.: lvs. oblong, to 8 in. long: fls. greenish, the panicles to 8 in. long: drupe 1½ in. long, orange. New Zeal.

CORYPHA. *Palmaceæ.* About 8 ponderous hermaphrodite fan-palms in trop. Asia, monocarpic (flowering and fruiting once and then dying at the age of 20–80 years), unarmed except for the spiny petioles, the immense panicled spadices terminal (above the crown): lvs. very large, stiff and heavy, deeply divided into many ridged segms.; petioles long, hard and stiff with strong spines or hooks on the margins: fls. small, produced in prodigious quantity; stamens 6: fr. a globose drupe size of a cherry. The true Coryphas are little planted within the limits of the U. S., the palms generally known under this name being Livistonas (a practice so far out of date that it should be discontinued). For cult. see *Palm.*

australis: *Livistona australis.*

elata (*C. Gebanga*). To 60 or 70 ft., the trunk bearing strong rough spiral ridges and furrows: lvs. 8–10 ft. diam., cut to about half the depth into 80 or 100 smooth hard segms. with rather obtuse bifid apex; petiole broad, 8–12 ft. long with black margins and widely spaced strong straight or curved spines: spadix much narrower than crown: fr. about 1 in. diam., olive-colored. Bengal and Burma.—The lvs. wither and fall when the plant begins to bloom.

Gebanga: *C. elata.*

rotundifolia: *Livistona rotundifolia.*

umbraculifera. Talipot Palm. To 40–80 ft., stocky, trunk ringed after lf.-bases fall: lvs. to 12 or 16 ft. broad, cleft to center into 80 or 100 linear-lanceolate stiff ridged acute or bifid segms.; petiole to 10 ft., narrowly channelled, with rather short compressed spines often in pairs: spadix equalling or exceeding crown: fr. about 1½ in. diam. Ceylon and Malabar Coast.

CORYPHANTHA. *Cactaceæ.* Ball-like or cylindric solitary or cespitose small cacti, Cent. Mex. to S. Canada, covered with spine-bearing tubercles which (except when very young) are grooved on upper face: fls. mostly yellow but sometimes red or purple, showy, expanding, borne near top of plant, the perianth long-persistent. Sometimes grown as little pot specimens, mostly known in cult. as Mammillarias. See *Cacti.*

aggregata (*Mammilaria aggregata. Cereus* and *Echinocereus aggregatus*). Solitary or in clumps, body globular or nearly so and very spiny, the radial spines many and appressed, centrals several and more erect: fls. showy, 2–3 in. across, purplish. New Mex., Ariz., Mex.—Very showy when in clumps.

arizonica (*Mammillaria arizonica*). Sometimes in clumps 3 ft. across, each head or body globose or ovoid and to 4 in. diam., the tubercles deeply grooved, spines many, stiff and straight: fls. 2–3½ in. across, rose-colored. N. Ariz.

clava (*Mammillaria clava*). Club-shaped, deep green, woolly in axils and red gland at base of groove, central spine 1, radials about 7: fls. 3 in. or more across, pale yellow, outer parts tinged red. Mex.

cornifera (*Mammillaria cornifera*). Body globose and pale green, with short broad tubercles, the radial spines 16 or 17 and central spine 1: fls. yellow tinged red, nearly 3 in. broad. Mex.

echinus (*Mammillaria echinus*). Globose to somewhat conic, 1–2 in. diam., with many closely appressed spines, the radials white, centrals often blackish: fls. 1–2 in. long, yellow. W. Tex.

elephantidens (*Mammillaria elephantidens*). Nearly globose, to 5 in. high and somewhat broader, tubercles obtuse and to 2 in. long, densely woolly in axils, spines 8 and all radial: fls. about 4 in. across, rose-colored. Mex.

erecta (*Mammillaria erecta*). Cylindric, yellowish-green, to 12 in. long, tubercles obliquely conic, spines 8–14, awl-like: fls. large and yellow, with very narrow segms. Mex.

macromeris (*Mammillaria macromeris*). Branching at base, body more or less cylindrical, to 8 in. long, the tubercles soft and several in. long, grooved two-thirds their length, radials many and white, centrals black: fls. to 3 in. broad, purple. Mex., W. Tex.

missouriensis: *Neobesseya missouriensis.*

Muehlenpfordtii (*Mammillaria Scheeri*). Body nearly globular and commonly simple, to 8 in. long and 6 in. thick, tubercles to 1 in. long and very woolly when young, radials 6–16 and straight, centrals 1–4: fls. yellow, about 2¼ in. long. W. Tex., New Mex., Mex.

neo-mexicana (*Mammillaria neo-mexicana*). Body globular or short-oblong, to about 4 in. long, covered with spines, the radials needle-like and white, centrals stouter and brown or black toward apex: fls. to 2 in. broad, greenish, purplish inside. New Mex., W. Tex.

Nickelsæ (*Mammillaria Nickelsæ*). Globular and cespitose, to about 3 in. high, pale green and glaucous, becoming purplish, tubercles almost hidden by overlapping radial spines: fls. bright yellow with red center, 2–3 in. broad. S. Tex., Mex.

octacantha (*Mammillaria octacantha*). Cylindric, to 1 ft. high and 6 in. diam., white-woolly in axils, the long tubercles with 1 or 2 red glands, radials 8 and rigid, centrals 1 or 2 and stouter: fls. straw-colored, 2 in. or more broad. Mex.

pectinata (*Mammillaria pectinata*). Globose, 1–2¼ in. diam., tubercles spiral, spines 16–24 and all radial some of them arched over apex of areole and yellowish-white with black tip: fls. yellow, 2 in. long. S. Tex., Mex.

radians (*Mammillaria radians*). Globose, about 3 in. diam., tubercles ovoid, the axils glabrous, spines 16–18 all radial and white or yellowish: fls. lemon-yellow, tinged red outside, 4 in. broad. Mex.

radiosa: *C. vivipara.*

recurvata (*Mammillaria recurvata* and *recurvispina*). Body depressed-globose, 4–8 in. diam., often making large masses, tubercles not prominent, radial spines about 20 yellow and recurved, centrals 1 or 2: fls. about 1–1⅜ in. long, brownish outside and lemon-yellow inside. Ariz., Mex.

robustispina (*Mammillaria robustispina* and *M. Brownii*). Solitary or clustered, body globular or nearly so, 2–6 in. high, almost hidden by spines, the radial 12–15 and 3 lower very stout, central solitary: fls. salmon, about 2 in. long. Ariz., New Mex., Mex.

Scheeri: *C. Muehlenpfordtii.*

vivipara (*Mammillaria vivipara, M. radiosa*). Solitary or in mound-like clusters, body globular and to 2 in. diam., tubercles prominent and woolly, radials about 16 and white, centrals 4–6: fls. nearly 2 in. long, purple, sepals fringed. Minn., Man., Alberta to Colo. and N. Tex.

CORYTHOLOMA. *Gesneriaceæ.* Trop. American herbs with tuberous roots, lvs. opposite or in 3's, fls. tubular and often 2-lipped, solitary or clustered in the axils, and fr. a caps.; one species grown under glass.

cardinalis (*Gesneria cardinalis. G. macrantha*). To 1 ft., hairy: lvs. ovate-cordate, to 6 in. long, toothed: fls. red, to 3 in. long. Habitat unrecorded.

COSMIDIUM: *Thelesperma Burridgeanum.*

COSMOS. *Compositæ.* Showy late-flowering ann. or per. herbs with opposite usually pinnately cut lvs. and heads solitary or in panicles, rays variously colored; pappus of awns or crown; native in trop. Amer. Closely allied to Dahlia.

Cosmos is cultivated in the flower-garden and is easily grown from seed but in the North it may be sown indoors in early spring if bloom is desired in late summer and early forms should be chosen. Sandy soil is preferred as the plants do not bloom well in rich soil in short-season climates.

bipinnatus. Ann. to 10 ft.: lvs. 2-pinnate into linear segms.: heads to 3 in. or more across, rays white, pink, crimson, disk yellow: achenes beaked. Mex.—In the anemone- or double-fld. forms the disk is replaced by a compact crowded mass of petal-like parts the same color as the rays. Early and late flowering strains of both the single and double forms are now sold.

diversifolius (*Bidens atrosanguinea. B. dahlioides. Dahlia Zimapani*). BLACK C. Per. to 16 in., grown as ann., with tuberous roots: lvs. entire or pinnately parted into 5–7 lfts.: heads to 2 in. across, long-stalked, disk red, rays dark velvety-red, sometimes tinged dark purple: achenes angled, not beaked. Mex.

sulphureus. YELLOW C. Ann. to 7 ft.: lvs. 2–3-pinnate into lanceolate lobes: heads to 3 in. across, rays pale or golden-yellow, disk yellow: achenes beaked. Mex.

COSTMARY: *Chrysanthemum Balsamita.*

COSTUS. SPIRAL FLAG. *Zingiberaceæ.* Stout trop. per. herbs, the sts. often spirally twisted, having leafy sts. and yellow, red or white fls. in dense spikes, the 1 staminode or lip petal-like.

They require tropical temperatures and rich moist soil. Propagated by cutting the stalks into about one-inch lengths and planting in sand and sifted moss or peat; also by division of the rootstocks. The plants are not often seen under glass as they require too much room. See *Zingiberaceæ.*

elegans: *C. Malortieanus.*

igneus. To 3 ft. high: lvs. to 6 in. long, oblong-lanceolate: fls. orange-red. Brazil.

Malortieanus (*C. elegans. C. zebrina*). To 3 ft. high: lvs. to 14 in. long and 7 in. wide, obscurely banded with green above: fls. yellow, the lip marked with red, in spikes to 2½ in. long. Cent. Amer.

speciosus. To 10 ft.: lvs. to 8 in. long and 2½ in. wide: fls. white with yellow center, in spikes to 5 in. long. E. Indies.

zebrina: *C. Malortieanus.*

COTINUS. *Anacardiaceæ.* Two woody deciduous species, one native in N. Amer. and the other S. Eu. to Cent. Asia and China, with simple lvs., small polygamous fls. in large loose terminal panicles, the sterile pedicels of the Old World species lengthening and clothed with spreading hairs and producing the "smoky" effect that gives the plant its common name, 5 stamens, fr. a small compressed drupe with style on one side.

Cotinus requires well-drained and not too rich soil. Propagated by seeds, root-cuttings and layers.

americanus (*Rhus americana* and *R. cotinoides*). Small tree to 30 ft. or more, with lvs. mostly obovate and cuneate or tapering at base: taller tree than the following and probably not as hardy, the panicles not showy but autumn lf.-color attractive. Tenn., Ala., to Tex.—Little planted.

coggygria (*Rhus Cotinus*). SMOKE-TREE. Bushy shrub to 15 ft.: lvs. oval, to 3 in. long: panicles much branched, to 8 in. long, usually purplish, June-July. S. Eu. to Asia. Var. **purpureus** (var. *atropurpureus*) has purplish lvs. and panicles with dark purple hairs. Var. **pendulus** has drooping branches.—Hardy N.

COTONEASTER. *Rosaceæ.* Shrubs or rarely small trees native in temp. regions of Old World, with alternate entire deciduous or persistent lvs., small white or pink fls. solitary or in clusters, and fr. a small red or black drupe. Some of them are more or less evergreen.

The genus has many ornamentals of first-class value in home gardens and landscape work, of attractive habit, interesting bloom and showy often persistent fruit. Most of them (unless otherwise noted) are hardy in the northern parts of the United States. Cotoneasters prefer sunny positions in well-drained soil. Propagated by seeds sown when ripe or stratified, by layers in autumn, by cuttings of young wood under glass late in summer, and rare kinds by grafting on stock of *C. integerrima* and the common quince or hawthorn.

acuminata. To 12 ft., deciduous: lvs. to 2½ in. long, pubescent on both sides: fls. pinkish, in 2–5-fld. clusters: fr. bright red. Himalayas.

acutifolia. To 12 ft., deciduous: lvs. to 2 in. long, pubescent on both sides when young: fls. pinkish, in 2–5-fld. clusters: fr. black. China. Var. **villosula,** lvs. densely pubescent beneath.

adpressa. Prostrate, deciduous: lvs. to ½ in. long, usually wavy at margins: fls. pinkish, 1–2 together: fr. bright red. China.

affinis. Tall deciduous shrub: lvs. to 3 in. long, pubescent beneath when young: fls. white. in many-fld. corymbs: fr. brown or nearly black. Himalayas; adapted to S. Var. **bacillaris** (*C. bacillaris*) has lvs. soon glabrous.

ambigua. To 6 ft., deciduous: lvs. to 2 in. long, pubescent beneath: fls. pinkish, in 5–10-fld. clusters: fr. black. China.

amœna. To 5 ft., densely branched, deciduous: lvs. about ½ in. long, densely pubescent below: fls. pinkish, in 6–10-fld. clusters: fr. orange-red. China.

angustifolia: *Pyracantha angustifolia.*

apiculata. To 6 ft., deciduous: lvs. to ½ in. long, pale and nearly glabrous below: fls. unknown: fr. bright red. China.

applanata: *C. Dielsiana.*

bacillaris: *C. affinis* var.

bullata. To 6 ft., deciduous: lvs. to 3 in. long, rugose, slightly pubescent: fls. pinkish, in 3–7-fld. clusters: fr. red. China. Var. **floribunda,** clusters many-fld. Var. **macrophylla,** lvs. to 5 in. long.

buxifolia. Low, densely branched: lvs. about ½ in. long, densely tomentose beneath, margins revolute: fls. white, in 2–6-fld. clusters: fr. red. India. Var. **vellæa** has smaller lvs. and often solitary fls.—The material usually cult. under this name is *C. prostrata* var. *lanata.*

congesta: *C. microphylla* var. *glacialis.*

crenulata: *Pyracantha crenulata.*

Dammeri (*C. humifusa*). Prostrate, the branches often rooting, evergreen: lvs. about 1 in. long, dark and shining above, pale beneath: fls. white, solitary: fr. bright red. China. Var. **radicans** has smaller lvs. and 1–2 fls. together.

Davidiana: *C. horizontalis.*

Dielsiana (*C. applanata*). To 8 ft., deciduous: lvs. to 1 in. long, tomentose beneath: fls. pinkish, in 3–7-fld. clusters: fr. bright red. China. Var. **elegans** has smaller half-evergreen lvs.

divaricata. To 6 ft., deciduous: lvs. to ¾ in. long, dark and shining above, pale beneath: fls. pinkish, in 3-fld. clusters: fr. bright red. China.

foveolata. To 10 ft., deciduous: lvs. to 4 in. long, pubescent and with prominent veins beneath: fls. pinkish, in 3–6-fld. clusters: fr. black. China.

Francheti. To 10 ft., evergreen or partially so: lvs. to 1¼ in. long, tomentose beneath: fls. pinkish, in 5–11-fld. clusters: fr. orange-red. China; not hardy N. Var. **cinerascens** is more vigorous.

frigida. To 25 ft., deciduous or semi-evergreen: lvs. to 5 in. long, tomentose beneath when young: fls. white, in dense tomentose clusters to 2½ in. across: fr. bright red. Himalayas; for southern states.

Gibbsii: *Pyracantha Gibbsii.*

glabrata. Evergreen: lvs. to 3 in. long, glaucous and nearly glabrous beneath: fls. white, in dense corymbs 1 in. across. China; not hardy N.

Harroviana. To 6 ft., semi-evergreen: lvs. to 2 in. long, leathery, densely tomentose beneath when young: fls. white, in dense clusters to 1½ in. across. China.

hebephylla. To 8 ft., deciduous: lvs. to 1 in. long, glaucous and becoming glabrous beneath: fls. white, in 6–16-fld. corymbs. China.

Henryana. To 12 ft., semi-evergreen, the branches drooping: lvs. to 5 in. long, gray-tomentose beneath when young: fls. white, in loose clusters to 2 in. across: fr. red. China; not hardy N.

horizontalis (*C. Davidiana*). To 3 ft., semi-evergreen, the branches spreading horizontally: lvs. to ½ in. long, slightly pubescent beneath: fls. pinkish, 1–2 together: fr. bright red. China. Var. **perpusilla** has lvs. ¼ in. or less long. Var. **variegata** has lvs. variegated with white.

humifusa: *C. Dammeri.*

hupehensis. To 6 ft., deciduous, the branches arching: lvs. to 1½ in. long, gray-tomentose beneath: fls. white, in 6–12-fld. clusters: fr. bright red. China.

integerrima (*C. vulgaris*). To 6 ft., deciduous: lvs. to 2 in. long, tomentose beneath: fls. pinkish, in nodding 2–4-fld. clusters: fr. red. Eu., N. Asia.

lactea. To 10 ft., evergreen or partially so: lvs. to 2 in. long, white- or yellow-tomentose beneath: fls. white, in corymbs 2 in. across: fr. red. China.

laxiflora: *C. melanocarpa* var.

Lemoinei: listed name.

Lindleyi. Similar to *C. racemiflora* but with longer lvs. and black fr. Himalayas.

lucida (*C. sinensis*). To 10 ft., deciduous: lvs. to 2 in. long, shining above, pubescent beneath when young: fls. pinkish, in 3–8-fld. clusters: fr. black. N. Asia.

melanocarpa (*C. nigra*). To 6 ft., deciduous: lvs. to 2 in. long, dark green above, white-tomentose beneath: fls. pinkish, in nodding 3–8-fld. clusters: fr. black. Eu., Asia. Var. **laxiflora** (*C. laxiflora*) has larger lvs. and many-fld. clusters.

microphylla. To 3 ft., evergreen, the branches spreading: lvs. to ⅓ in. long, dark and shining above, gray-pubescent beneath: fls. white, usually solitary: fr. bright red. Himalayas. Var. **glacialis** (*C. congesta*) has glabrous lvs. and pinkish fls. Var. **thymifolia** (*C. thymifolia*) has narrower lvs. and 2–4-fld. clusters.

moupinensis. To 15 ft., deciduous: lvs. to 4 in. long, pale and pubescent beneath, the veins conspicuous: fls. pinkish, in many-fld. clusters: fr. black. China; needs protection N.

multiflora (*C. reflexa*). To 6 ft., deciduous: lvs. to 2 in. long, becoming glabrous: fls. white, in many-fld. loose clusters: fr. red. Asia. Var. **calocarpa** has larger lvs. and fr.

nigra: *C. melanocarpa.*

nitens. To 4 ft., deciduous, the branches spreading: lvs. to ¾ in. long, dark green and shining above, becoming glabrous beneath: fls. pink, in 3-fld. clusters: fr. purplish-black. China.

nummularia: *C. racemiflora.*

obscura. Deciduous, to 10 ft.: lvs. elliptic to obovate or somewhat rhombic, to 2 in. long, gray underneath: fls. pinkish, in short clusters of 3–7: fr. somewhat pyriform, dark red. China.

pannosa. To 10 ft., semi-evergreen, the branches arching: lvs. to 1 in. long, white-tomentose beneath: fls. white, in 6–20-fld. clusters: fr. red. China; not hardy N.; common in Calif.

praecox: a listed name.

prostrata (*C. microphylla* var. *Uva-ursi*). To 12 ft., evergreen, the branches arching: lvs. to ¾ in. long, dark and shining above, slightly hairy beneath: fls. white, in 1–3-fld. clusters: fr. red. Himalayas; probably not hardy N. Var. **lanata** (*C. Wheeleri*), lvs. tomentose beneath.

Pyracantha: *Pyracantha coccinea.*

racemiflora (*C. nummularia*). To 8 ft., deciduous: lvs. to 1¼ in. long, gray-tomentose beneath: fls. white, in 3–12-fld. clusters: fr. red. S. Eu., N. Afr., Asia. Var. **Royleana** (var. *orbicularis*) is a low form with broad lvs. Var. **songarica** has less pubescent lvs.

reflexa: *C. multiflora.*

rhytidophylla. Evergreen: lvs. to 3 in. long, wrinkled above, white- or yellow-tomentose beneath: fls. white, in dense corymbs 1 in. across: fr. orange-red. China; not hardy N.

Rogersiana: *Pyracantha crenulata* var.

rotundifolia. To 8 ft., semi-evergreen: lvs. to ½ in. long, slightly pubescent when young: fls. white tinged pink, usually solitary: fr. bright red. Himalayas, China.—Some of the material passing under this name is *C. prostrata.*

salicifolia. To 15 ft., evergreen or partially so: lvs. to 3 in. long, rugose, tomentose beneath: fls. white, in tomentose clusters to 2 in. across: fr. bright red. China. Var. **floccosa** has lvs. shining above and var. **rugosa** dull green above.

serotina. Small tree, young shoots silky-pubescent: lvs. to 3 in. long, becoming glabrous: fls. in clusters to 3 in. across: fr. red. China.

Simonsii. To 10 ft., semi-evergreen: lvs. to 1¼ in. long, pubescent beneath: fls. white, in 2–4-fld. clusters: fr. bright red. Himalayas.

sinensis: *C. lucida.*

songarica: *C. racemiflora* var.

thymifolia: *C. microphylla* var.

tomentosa. To 10 ft., deciduous: lvs. to 2½ in. long, gray-tomentose beneath: fls. pinkish, in nodding 3–12-fld. clusters: fr. brick-red. S. E. Eu., W. Asia.

turbinata. To 6 ft., semi-evergreen: lvs. to 1¾ in. long, silky-pubescent beneath: corymbs many-fld., white-tomentose: fr. bright red. China.

vulgaris: *C. integerrima.*

Wheeleri: *C. prostrata* var. *lanata.*

Wilsoni. To 4 ft.: lvs. pale and pubescent below: fls. white, in panicled clusters. Japan.

Zabeli. To 6 ft., deciduous: lvs. to 1¼ in. long, gray-tomentose beneath: fls. pinkish, in nodding 3–9-fld. clusters: fr. bright red. China.

COTTON: *Gossypium.* **Lavender-**: *Santolina Chamæcyparissus.*

COTTON-WEED: *Diotis candididissima.*

COTTONWOOD: *Populus.*

COTULA (*Leptinella*). *Compositæ.* Ann. and per. herbs, mostly of low stature and creeping or tufted, in the southern hemisphere but a few of them nat. elsewhere and one of them listed in this country as a rock-garden foliage subject: lvs. alternate, pinnatifid or rarely entire: heads small, peduncled, without rays; pappus lacking.

aurea: *Matricaria aurea.*

squalida. Per. a few in. high, the branches creeping 12 in. or more, soft-hairy: lvs. narrow, to 2 in. long, deeply pinnatifid and fern-like, the segms. also cut: heads ⅓ in. or less diam. New Zeal.

COTYLEDON: seed-leaf; the primary leaf or leaves in the embryo; in some plants the cotyledon always remains in the seed-coats and under ground and in others (as common bean) it emerges on germination.

COTYLEDON. *Crassulaceæ.* Succulents with simple basal or st.-lvs. and white, yellow, red or greenish fls. in terminal racemes or cymes, characterized by tubular corolla that is much longer than the calyx; natives of the Old World, particularly S. Afr. and Medit. region, seldom cult. with us in greenhouses or rock-gardens. Cult. as for Sedum and Sempervivum; see *Succulents.*

agavoides: *Urbinia agavoides.*

cæspitosa: *Dudleya cæspitosa.*

Cooperi. A little plant, to 12 in., scarcely caulescent: lvs. 5–6 near base, spatulate, 2 in. long, spotted: fls. 6–10, red and greenish, tubular, about ⅝ in. long. S. Afr.

densiflora: *Stylophyllum densiflorum.*

elegans: *Oliveranthus elegans.*

farinosa: *Dudleya farinosa.*

gibbiflora: *Echeveria gibbiflora.*

Hoveyi: *Echeveria Hoveyi.*

lanceolata: *Dudleya lanceolata.*

laxa: *Dudleya laxa.*

lurida: *Dudleya lurida.*

orbiculata. To 4 ft.: lvs. opposite, oblong to roundish, to 4 in. long, entire: fls. red, drooping. S. Afr.

Pachyphytum: *Pachyphytum bracteosum.*

paraguayensis: *Byrnesia Weinbergii.*

Plattiana: *Dudleya Plattiana.*

pulverulenta: *Dudleya pulverulenta.*

secunda: *Echeveria secunda.*

Semenovii (*Umbilicus Semenovii*). To 18 in.: lvs. all linear and somewhat spinescent, the middle ones 1½ in. long: fls. white becoming reddish, in a terminal raceme. Temp. Asia.

septentrionalis: *Dudleya septentrionalis.*

simplicifolia. To 6 in.: lvs. roundish, irregularly and coarsely toothed: fls. yellow, drooping.

Umbilicus (*Umbilicus pendulinus*). NAVELWORT. PENNYWORT. To 1 ft.: lvs. orbicular, peltate, coarsely toothed: fls. yellowish-green, drooping. W. Eu. to W. Asia and trop. Afr.

COUTAREA. *Rubiaceæ.* Trees and shrubs, native Mex. to S. Amer., bearing opposite simple stalked lvs., and large (2–4 in. long) white or yellowish funnelform-campanulate pedicillate fls. mostly in small cymes; stamens 5–8; style filiform: fr. an ovoid or obovoid caps.

hexandra. To 15 ft. or more: lvs. ovate to oval, to about 5 in. long, sharp-pointed, entire: fls. mostly in 3's, the corolla white or yellowish and tinged purple toward base. Mex. to Argentina.

COVER-CROP. A crop grown primarily for the covering and protecting of land, particularly in orchards, after the final tillage in summer until the following spring when tillage recurs. It may be a green crop not killed by the winter as crimson clover, or a one-season crop that is killed by frost but remains on the land till spring, as peas. The crop is turned under in spring and then acts as an amendment to the soil. Many kinds of plants may be employed as cover-crops; crimson clover, vetch, rape, wheat, winter oats, soybean, cowpea, buckwheat, beggarweed, crotalaria, peas, barley, millet are some of them. In this sense the term cover-crop was first employed in 1892 (Cornell Bulletin 59), suggested by the author's observations of "cover" for game in Ireland.

COVILLEA: *Larrea.*

COWAGE: *Stizolobium pruritum.*

COWANIA. *Rosaceæ.* Evergreen shrubs or small trees of Mex. and S. W. U. S., with leathery sticky lvs., solitary fls., and achenes with long feathery tails; not showy, but sometimes planted in native or similar regions.

Stansburiana. Shrub to 12 ft.: lvs. to ½ in. long, 3–5-parted into toothed lobes: fls. white or pale yellow, ¾ in. long. Colo. to Mex.

COWBERRY: *Vaccinium Vitis-idæa.*

COW-HERB: *Saponaria Vaccaria.*

COWITCH: *Stizolobium pruritum.*

COWPEA: *Vigna sinensis.*

COW POISON: *Delphinium trolliifolium.*

COWSLIP: *Primula veris*; also *Caltha palustris, Mertensia virginica.* **American**: *Dodecatheon.* **Cape-**: *Lachenalia.*

CRAB-APPLE: *Pyrus.*

CRACCA: *Tephrosia.*

CRAMBE. *Cruciferæ.* A score of herbs, sometimes woody at base, ann., bien. and per., mostly in Eurasia, sometimes grown for ornament and one as an esculent: lvs. mostly thick or fleshy, glaucous, often very large, lobed, cut, lyrate or pinnatifid: fls. small but numerous, in panicles: fr. a 2-pointed indehiscent pod or silicle, the upper joint 1-seeded and globular.

cordifolia. Stout striking per. to 7 ft.: radical lvs. cordate, to 2 ft. and more across, somewhat lobed and stout-dentate, long-stalked, more or less hispid-hairy: fls. ⅓ in. across, white, in great terminal leafless panicle. Caucasus.

hispanica. Hispid much branched ann. to 3 ft.: lvs. with oval to nearly orbicular terminal part and lobed or lyrate below, to 3 in. across, margins sinuate: fls. small, white, in long open racemes. Medit. region.

maritima. SEA-KALE (which see). Stout stocky per. to 3 ft., with fleshy large glaucous-blue foliage: radical lvs. to 2 ft. or more long and nearly as broad, notched and shallowly lobed, stout-stalked: fls. white, in panicles: fr. a pea-like body. Seacoasts, W. Eu. to Asia Minor.

CRANBERRY. The trailing swamp cranberry, *Vaccinium macrocarpon*, is cultivated extensively, particularly in Massachusetts, New Jersey and Wisconsin, in artificial or developed bogs. The small or European cranberry, native in the northern parts of America, is a distinct species, *Vaccinium Oxycoccus*, not cultivated here; the mountain cranberry, brought to market from the wild in the northern parts of America and Europe is still another Vaccinium, *V. Vitis-idæa.*

The American cranberry is grown in acid peat bogs, which may be flooded. The area is kept under water during winter, largely to protect the plants from winter injury by the heaving and thawing of the bogs. Flooding may also be employed at other intervals to drown insects, mitigate drought, and protect against frost and fires. Every good cranberry bog should have facilities for flooding. The ordinary practice is to choose a bog with a creek running through it, or through which a creek or ditch may be diverted. At the lower side of the bog flood-gates are provided, so that when the gates are shut the water backs up and covers the area. It is best that the bog be comparatively flat, so that the water will be of approximately equal depth over the whole area. At the shallowest places the water should stand about a foot above the plants. The water is usually let on the bog early in December and kept on until April or early May. No flooding is provided at other times unless there is some particular occasion therefor.

Before the vines are set all the wild and turfy growth should be taken off the bog. This is accomplished either by digging it off and removing it bodily, or by drowning it out by a year's flooding. The latter method is generally considered to be the better. After the turfy growth is removed, the bog is smoothed and covered 2 or 3 inches deep with clean sand. The vines are then set, the lower ends of them being shoved through the sand into the richer earth. To prevent too rapid and tangled growth, it is customary to re-sand the bog every three or four years to a depth of ¼ or ½ inch. When sanding is not practicable, the vines may be mown off when they become too luxuriant.

Plants for setting are merely cuttings or branches of the vines. These cuttings may be 5 to 10 inches long. They are inserted into the ground in a hole made by a crowbar or stick. They are usually planted at distances of 12 to 18 inches each way, and the vines allowed to cover the entire ground as with a mat. In three years a good crop should be secured, if the weeds and wild growth are kept down. A crop ranges 50 to 100 barrels to the acre.

CRANBERRY-BUSH: *Viburnum Opulus* and *trilobum.*

CRANESBILL: *Geranium.*

CRANTZIA: *Alloplectus.*

CRAPE-MYRTLE: *Lagerstrœmia.*

CRASPEDIA. *Compositæ.* Per. herbs with alternate or basal entire lvs. and small heads of disk-fls. crowded in dense compound involucral heads; pappus of plumose hairs; native in New Zeal., Australia and Tasmania, sometimes planted in Pacific region.

uniflora. To 1½ ft., usually tomentose: lvs. mostly basal, oblong or spatulate, to 8 in. long: compound heads to 2 in. across, solitary and terminal.

CRASSINA: *Zinnia.*

CRASSOCEPHALUM: *Gynura.*

CRASSULA. *Crassulaceæ.* Old World succulent herbs and shrubs, mostly S. African, with opposite fleshy lvs. and white, rose or yellow fls. in cymes or clusters, the petals little if at all united, sepals, petals and stamens 5 or sometimes 4; grown in greenhouses and windows and out-of-doors in warm regions. In Calif. and similar climates other species may be found in the collections of fanciers. For cult. see *Succulents.*

arborescens. Shrub to 10 ft.: lvs. roundish-ovate, to 2½ in. long, nearly joined at base, glaucous: fls. rose-red. S. Afr.

Bolusii: *C. Cooperi.*

centauroides. Sts. more or less prostrate and rooting at nodes, to 3 ft. long, forking, glabrous: lvs. connate, ovate to cordate-ovate or obovate, rather thin, nearly or quite entire: fls. slender-pedicelled, petals crimson at apex and shading to white at base. S. Afr.

coccinea: *Rochea coccinea.*

Cooperi (*C. Bolusii*). Tufted, to 5 in. high: lvs. opposite, elliptic-lanceolate, acute, to 1 in. or less long, with black blotches: fls. very small, in little terminal clusters, calyx red, petals pale flesh-color. S. Afr.—See also *C. monticola.*

cordata. Shrubby, to 3 ft.: lvs. opposite, petiolate, cordate-kidney-shaped and obtuse, to 1 in. across, entire: fls. white or reddish, small, in peduncled cymes. S. Afr.—See *C. spathulata.*

dejecta: see *C. obvallata.*

elata. White-pubescent, to 2 ft.: lvs. opposite, oblong to nearly lanceolate, to 1½ in. long, somewhat acute: fls. small, white or whitish, in small dense sessile clusters. S. Afr.

falcata. Shrub to 8 ft.: lvs. oblong, falcate, nearly or quite obtuse, to 4 in. long, joined at base, glaucous: fls. bright crimson, rarely white. S. Afr.

gigantea: see *C. perfoliata.*

impressa (*C. Schmidtii*). Dwarf, to 4 in. high: lvs. opposite, linear-lanceolate, thick, convex on back, to 1¾ in. long, acute: fls. small, rose-colored, in terminal little clusters. S. Afr.—Much like *C. Cooperi.* Said to be grown erroneously as *C. rubicunda.*

lactea. Shrubby, to 2 ft.: lvs. connate, narrow-obovate, to 3 in. long, more or less acute or acuminate: fls. white. S. Afr.—Belongs in group with *C. portulacea* and *C. arborescens.*

longifolia: see *C. perfoliata.*

lycopodioides. Sts. 1–2 ft. long, lopping or spreading, lycopodium-like, with slender brittle branches covered with appressed scale-like lvs. in 4 ranks: fls. minute, purplish, 1 or few in axils. S. Afr.

marginalis: form of *C. centauroides* with lvs. subsessile rather then connate.

monticola. To 1 ft. or more, glabrous: lvs. connate, ovate-acute, to ¾ in. long, glaucous: fls. small, pinkish, in short-peduncled terminal clusters. S. Afr.—Said to be grown sometimes under the name *C. Cooperi.*

multicava (*C. quadrifida*). Low herb: lvs. oval. to 3 in. long, the bases of the petioles joining: fls. white. S. Afr.—Frequent in S. Calif. and in conservatories.

obvallata. St. to 6 in., leafy, simple: lvs. lance-oblong or knife-shaped, obtuse or nearly so, to 2½ in. long, glabrous, ciliate: peduncle scape-like, bearing a panicle of small green fls. S. Afr.—Said to be sometimes grown improperly as *C. dejecta.*

perfoliata. Like *C. falcata* but lvs. longer, lanceolate and acuminate, to 6 in. long, concave above: fls. crimson or white. S. Afr.—Said to be grown as *C. gigantea* and *C. longifolia.*

perfossa. Shrub to 2 ft.: lvs. roundish or ovate, to 1 in. long, joined at base, glaucous. S. Afr.

portulacea. Shrub to 10 ft. with opposite branching or forking habit: lvs. oval to oblong-spatulate, to 1½ in. long, distinct at base, very thick and shining, obtuse: fls. rosy-red. S. Afr.—Known sometimes under the erroneous names *Sedum dendroideum, S. arboreum* and *S. spectabile;* popular as a fleshy shrub in S. Calif. where it blooms freely; frequent as a pot plant in the N. but seldom blooms.

purpurascens: see *Sempervivum arboreum.*

quadrifida: *C. multicava.*

rosularis. Herbaceous with radical lvs., which are in a rosette, oblong-lanceolate to strap-shaped, to 5 in. or more long, acute, flat, ciliate: fls. small, white, in branching panicle. S. Afr.

rubicunda: see *C. impressa.*

Schmidtii: *C. impressa.*

spathulata. Shrubby, with trailing sts.: lvs. broadly cordate, wavy-margined, petioled: fls. pink. S. Afr.—Sometimes erroneously called *C. cordata.*

tetragona. Shrub to 2 ft.: lvs. 3-sided, to 1¾ in. long, nearly joined at base: fls. white. S. Afr.

CRASSULACEÆ. ORPINE FAMILY. Succulent herbs or pliable shrubs of about 20 widely distributed genera in temp. and trop. regions of both hemispheres, characterized by bisexual regular fls. having 4–5 sepals and petals which are free or united, 4–10 stamens, and superior ovary of 4–5 carpels free or united below. Several genera are grown in the greenhouse or rock-garden or regularly in the open, as Æonium, Aichryson, Bryophyllum, Byrnesia, Cotyledon, Crassula, Dudleya, Echeveria, Graptopetalum, Greenovia, Kalanchoe, Oliveranthus, Pachyphytum, Rochea, Sedum, Sempervivum, Stylophyllum, Urbinia.

CRATÆGOMESPILUS. HAW-MEDLAR. *Rosaceæ.* A group of hybrids between the genera Cratægus and Mespilus, of which a few forms are known; deciduous shrubs or small trees.

grandiflora (*Cratægus grandiflora*). Hybrid between *C. Oxyacantha* and *M. germanica:* shrub or tree: lvs. to 3 in. long, toothed, pubescent beneath: fls. white, 1 in. across, 1–3 together, May–June; fr. about ½ in. diam., nearly globose, pubescent. Old plant of European origin. Hardy N.

CRATÆGUS. Hawthorn. Thornapple. *Rosaceæ.* Spiny deciduous shrubs or small trees, often horizontally branched, with alternate toothed or lobed lvs., white or rarely red fls. in corymbs in spring and early summer, and fr. a small pome with 5 or fewer 1-seeded nutlets; native in north temp. zone. The species of hawthorn are numerous and most of them are desirable ornamental subjects. In this account only those kinds are included that are most planted or are in trade-lists. The native American species should have greater attention from planters. Nearly all of them are hardy N. The English hawthorn, considerably planted in this country, is two species, *C. monogyna* and *C. Oxyacantha.*

Hawthorns are very ornamental and any of them are likely to be transplanted from the wild. They are attractive in habit, in bloom and in fruit. They prefer sunny locations and limestone or rich loamy soils. Propagated by seeds sown when ripe or stratified; the seeds should be separated from the pulp by allowing the fruit to decay or by soaking the fruit in water. Seeds will take two years or more to germinate, and should be sown in flats and kept in a cool cellar. Rare sorts may be budded or grafted on stock of *C. Oxyacantha* or other species.

acicularis: perhaps *Sorbopyrus acicularis.*

apiifolia (*C. Marshallii*). To 20 ft., spines about 1 in. long: lvs. to 1½ in. long, pinnately 5–7-lobed: fls. ½ in. across: fr. scarlet, about ¼ in. long. Va. to Fla. and Tex.

arkansana. To 20 ft., spines to ½ in. long or wanting: lvs. to 3 in. long, with shallow lobes: fls. 1 in. across: fr. bright red, to 1 in. long. Ark.

Arnoldiana. To 20 ft., spines to 3 in. long: lvs. to 3 in. long, shallowly lobed, shining above: fls. to ¾ in. across: fr. bright red, ¾ in. long. Mass. to N. Y.

Azarolus. Azarole. To 30 ft., spines small or wanting: lvs. to 3 in. long, deeply 3–5-lobed, pubescent beneath: fls. ½ in. across: fr. orange-red or yellow, to ¾ in. long. S. Eu., N. Afr., W. Asia.

Barryana. Shrub to 15 ft., with slender spines: lvs. broad-ovate, slightly lobed, double-serrate, glaucous below, to 3 in. long: fls. ¾ in. across, anthers purple: fr. crimson, pale-dotted. W. N. Y.

Carrierei: *C. Lavallei.*

cerronis (*C. erythropoda*). To 15 ft., spines 1 in. long: lvs. 2 in. long, coarsely toothed: fls. ½ in. across: fr. black or brown. Colo., Wyo.

chippewaensis. To 25 ft., spines to 1½ in. long: lvs. to 3 in. long, shallowly lobed: fls. ¾ in. across: fr. crimson, ¾ in. long. S. Ont.

coccinea: *C. intricata.*

coccinoides. Tree to 20 ft., thorny: lvs. broad-ovate, broadly lobed, double-serrate, to 3½ in. long: fls. ¾ in. across: fr. nearly globose, dark crimson and shining. Ind. west.

coloradensis. To 15 ft., spines to 2 in. long: lvs. to 2 in. long, toothed: fls. about ½ in. across: fr. scarlet, about ½ in. long. Colo.

cordata: *C. Phænopyrum.*

crenulata: *Pyracantha crenulata.*

Crus-galli. Cockspur Thorn. To 25 ft. or more, spines several in. long: lvs. to 3 in. long, toothed: fls. ½ in. across: fr. dull red, ½ in. long. Que. to N. C. and Mich.

diffusa. To 30 ft., spines to 1½ in. long: lvs. to 2 in. long, shallowly lobed, pale beneath: fls. ½ in. across: fr. dull red, about ½ in. long. N. H. to N. Y.

Douglasii. To 30 ft., spines to 1 in. long: lvs. to 3 in. long, toothed, shining above: fls. ½ in. across: fr. black, shining, ½ in. long. B. C. to Calif. and Minn.

dsungarica. Spines to ¾ in. long: lvs. to 3 in. long, 3–5-lobed: fls. ½ in. across: fr. black, shining, ½ in. long. N. Asia.

Dunbari. To 12 ft., spiny: lvs. nearly orbicular, slightly lobed: fls. ½ in. across: fr. crimson, ½ in. across. W. N. Y.

Ellwangeriana. To 20 ft., spines to 2 in. long: lvs. to 4 in. long, shallowly lobed: fls. 1 in. across: fr. bright red, shining, 1 in. long. Ont. to Pa. and Mich.

erythropoda: *C. cerronis.*

flava. To 20 ft., spines about 1 in. long: lvs. 2 in. long, coarsely toothed: fls. ¾ in. across: fr. dark orange-brown, ½ in. long. Ga., Fla.

florentina: *Pyrus florentina.*

Fontanesiana. Closely resembling *C. Crus-galli* but with thinner lvs. and brick-red frs. Pa.

formosa. To 10 ft., spines to 1¼ in. long: lvs. to 2 in. long, doubly toothed, pale below: fls. 1 in. across: fr. bright red, ½ in. long. N. Y.

glabra: *Photinia serrulata.*

grandiflora: *Cratægomespilus grandiflora.*

Heldreichii. Lvs. to 1 in. long, with nearly entire lobes, pubescent beneath: fr. red. Greece.

intricata (*C. coccinea*). To 10 ft., spines few: lvs. to 3 in. long, shallowly lobed: fls. 1 in across: fr. reddish-brown. Mass. to N. C.

Lalandi: the plant advertised under this name is undoubtedly *Pyracantha coccinea* var. *Lalandi.*

Laneyi. To 10 ft., spines to 2 in. long: lvs. to 3 in. long, doubly toothed: fls. 1 in. across: fr. dark orange-red, shining. N. Y.

Lavallei (*C. Carrierei*). Hybrid probably between *C. Crus-galli* and *C. pubescens*: to 20 ft., spines 2 in. long: lvs. to 4 in. long, toothed, pubescent beneath: fls. with red disk, ¾ in. across: fr. brick-red, ½ in. long.

Marshallii: *C. apiifolia.*

mexicana: *C. pubescens.*

mollis. To 30 ft., spines to 2 in. long: lvs. to 4 in. long, doubly toothed, pubescent beneath: fls. with red disk, 1 in. across: fr. scarlet, to 1 in. long. Ohio to S. D. and Kans.

monogyna. English H. To 30 ft., spines to 1 in. long: lvs. to 2 in. long, deeply 3–7-lobed and margins nearly or quite entire: fls. ½ in. across; style prevailingly 1: fr. bright red, ½ in. long, with 1 stone or seed. Eu., N. Afr., W. Asia.—Often confused with *C. Oxyacantha.* Var. **pendula** has drooping branches. Var. **pteridifolia** (*C. Oxyacantha* var. *filicifolia*), lvs. deeply lobed. Var. **stricta,** habit fastigiate. Some of the vars. advertised under *C. monogyna* belong to *C. Oxyacantha.*

nitida. To 30 ft., spines to 1½ in. long: lvs. to 3 in. long, coarsely toothed, shining above: fls. ¾ in. across: fr. dull red, ½ in. long. Ill. to Ark.

Oxyacantha (*C. oxyacanthoides*). English H. To 15 ft., spines 1 in. long: lvs. to 2 in. long, with 3–5 broad serrate lobes: fls. ½ in. across; styles prevailingly 2: fr. bright red, ½ in. long, with 2 stones. Eu., N. Afr. Var. **Paulii** (var. *splendens*), fls. bright scarlet, double. Var. **plena** (*C. monogyna* var. *albo-plena*), fls. white, double. Var. **punicea,** fls. dark red. Var. **rosea,** fls. rose.

pentandra. Tree to 15 ft., with many thorns: lvs. oval to ovate, to 2½ in. long, with many short sharp lobes: fls. to ¾ in. across, anthers red-purple: fr. short-oblong, dark crimson and shining. Vt., Conn., N. Y.

peregrina. Tree: lvs. with 4–6 pairs of narrow lobes, pubescent beneath: fr. dull purple, about ½ in. long. Probably W. Asia.

persistens. Like *C. Crus-galli* and perhaps a hybrid, the stamens more numerous (15–20): tree to 12 ft. or more, thorny: lvs. oblong to obovate, to 3 in. long, serrate, glossy above and remaining green to winter: fls. ¾ in. across: fr. persistent.

Phænopyrum (*C. cordata*). Washington Thorn. To 30 ft., spines to 3 in. long: lvs. to 3 in. long, 3–5-lobed, shining above: fls. ½ in. across: fr. bright red, ¼ in. long. Va. to Ala.

pinnatifida. To 20 ft., spines small or lacking: lvs. to 4 in. long, pinnately 5–9-lobed, dark and shining above: fls. ½ in. across: fr. red, ¾ in. long edible. N. E. Asia. Var. **major** has larger lvs. and fr.

procera. To 20 ft., spines 1 in. long: lvs. to 2 in. long, doubly toothed: fls. to 1 in. across: fr. bright red, ½ in. across. N. Y.

pruinosa. To 20 ft., spines to 1½ in. long: lvs. to 2 in. long: shallowly lobed: fls. 1 in. across: fr. dark purple, ½ in. long. Vt. to Va. and Ill.

prunifolia. To 30 ft.: lvs. to 3 in. long, doubly toothed: fls. with pink anthers: fr. red. Origin unknown.

pubescens (*C. mexicana*). To 30 ft., spines to 1½ in. long or wanting: lvs. to 3 in. long, finely toothed, pubescent beneath: fls. ¾ in. across: fr. greenish-yellow or orange, 1 in. long. Mex.

punctata. To 30 ft., sometimes unarmed: lvs. to 4 in. long, toothed, pubescent beneath: fls. ½ in. across: fr. dull red, to ¾ in. long. Que. to Ga. and Ill.

Pyracantha: *Pyracantha coccinea.*

rivularis. To 20 ft., spines to 1½ in. long: lvs. to 3 in. long, doubly toothed, pale beneath: fls. ½ in. across: fr. dark red, becoming black and shining, to ½ in. long. Wyo., Colo., Utah.

rotundifolia. Bushy, to 15 ft. or more, with slender thorns: lvs. broad-ovate to obovate, to 2 in. long, double-serrate: fls. ¾ in. across: fr. nearly globular, red, yellow-fleshed. N. S. west, south to Va.

saligna. To 20 ft., spines to 1½ in. long: lvs. to 2 in. long, dark and shining above, pale beneath: fls. ½ in. across: fr. dark red and shining, ¼ in. long. Colo.

Sargentii. To 20 ft., spines to 1½ in. long: lvs. to 3 in. long, shallowly lobed, pale beneath: fls. to 1 in across: fr. yellow flushed with red, ½ in. long. Ga. to Ala.

spathulata. To 25 ft., spines 1 in. long or wanting: lvs. to 2 in. long, often 3–5-lobed at apex: fls. ½ in. across: fr. bright red, shining, ⅛ in. across. Va. to Fla. and Tex.

stipulosa. Tree: lvs. to 3 in. long, finely toothed, pale and pubescent beneath: fls. ½ in. across: fr. orange-red, to 1 in. long. Mex.

succulenta. To 15 ft., spines to 2 in. long: lvs. to 3 in. long, coarsely toothed, shining above: fls. ½ in. across: fr. bright red, ½ in. across, pulpy. Que. to Ill.

tomentosa. To 20 ft., spines to 1½ in. long or wanting: lvs. to 5 in. long, sometimes slightly lobed, pubescent beneath: fls. ½ in. across: fr. dull orange-red, ½ in. long. Ont. to Ga. and Kans.

yunnanensis: plants cult. under this name are unundoubtedly *Pyracantha Gibbsii* var. *yunnanensis.*

CREAM-CUPS: *Platystemon californicus.*

CREEPER: a trailing plant or shoot that takes root mostly throughout its length; sometimes applied to a tight-clinging vine.

CREEPING CHARLEY: *Pilea nummulariæfolia.*

CREEPING CHARLIE: *Lysimachia Nummularia.*

CREEPING JENNIE: *Lysimachia Nummularia.*

CRENATE: shallowly round-toothed or obtusely toothed, scalloped.

CREOSOTE BUSH: *Larrea.*

CREPIS. Hawks-Beard. *Compositæ.* Herbs with pinnate toothed or lobed lvs. and solitary or panicled heads of yellow, orange or red ray-fls.; pappus of soft white hairs; native mostly in the northern hemisphere, a few grown in the flower-garden. Propagated by seeds.

barbata: *Tolpis barbata.*

Dioscoridis. Ann., branching: basal lvs. obovate or oblong, toothed or lyrate, upper linear, entire: heads solitary, yellow. Greece.

grandiflora. Per. to 1 ft.: lvs. linear-lanceolate, toothed, white-hairy: heads 2–5, golden-yellow, 2 in. across. Eu.

rubra. Branching ann. to 1½ ft.: lvs. toothed or lobed, nearly glabrous: heads solitary on long peduncles, red. Italy, Greece. Var. **alba** has white or flesh-colored fls.

virens. Ann. to 1½ ft.: lvs. toothed or pinnate, glabrous: heads yellow, the outer florets tinged pink. Eu.

CRESCENTIA. *Bignoniaceæ.* Trop. American trees with simple usually clustered lvs., large tubular 5-lobed fls., and hard-shelled globose frs.; grown in the tropics for the fr. which is used for water-gourds, as well as for ornament.

Cujete. Calabash-Tree. To 40 ft., with long spreading branches and broad head: lvs. oblanceolate, to 6 in. long, nearly sessile: fls. yellowish-purple, 2 in. long, the lobes cut: fr. 1 ft. or more across, like a hard-shelled gourd, nearly or quite globular, smooth. Trop. Amer.

CRESS. *Cruciferæ.* Several plants are known as cress, the piquant basal leaves used as salad, seasoning, or garnishing, but the usual kinds are of three very unlike genera and they should not be confused. See also *Cardamine.*

The usual or common garden cress is a pepper-grass, *Lepidium sativum.* It is a quick-growing hardy upright annual, native in western Asia but now sometimes escaped as a weed. Seeds may be sown in the open as soon as the ground can be made ready, usually in drills about 1 foot apart; leaves may be had in five to eight weeks, and new ones arise if the cutting is not too close. New sowings may be made every two or three weeks for succession, although the product is not so much prized in midsummer and the plants quickly run to seed in hot weather. In August sowings may be begun for autumn use. The curled variety is most prized for garnishing, like parsley. Cress thrives in any good garden soils, those retentive of moisture being preferable.

Upland-cress, sometimes called winter-cress, is a hardy biennial, *Barbarea verna* (*præcox*), native in Europe and sometimes run wild in this country. Seeds of it may be sown in very early spring in the open, and considerable tufts of leaves are formed by midsummer or a little later; if left in the ground, the plant persists the winter even in the northern states and in the spring goes to seed. A closely related plant is the common weedy yellow-rocket (*B. vulgaris*) that is conspicuous in spring in fields with its light yellow flowers. Upland-cress is a rather coarse plant, and is not largely grown.

Water-cress is a prostrate or trailing plant whose brittle soft shoots root in the water and mud. It is *Nasturtium officinale* of botanists, although it carries other Latin names, as *Roripa Nasturtium-aquaticum* and *Sisymbrium Nasturtium-aquaticum.* It is native in Europe and is extensively naturalized in other parts of the world. The plant thrives in ditches, pools and stream margins, but it can be grown readily in frames or other places where the ground can be kept wet. It is usually propagated by planting pieces of the stems, although it is readily grown from seeds. It is perennial and hardy everywhere, and takes care of itself when once established. It may be colonized in a clear clean pool or stream.

CRESS, BITTER-: *Cardamine.* **Blister-**: *Erysimum.* **Indian**: *Tropæolum.* **Penny-**: *Thlaspi.* **Rock-**: *Arabis.* **Stone-**: *Æthionema.* **Wart-**: *Coronopus.*

CRESTED: bearing elevated and irregular or toothed ridge or protuberances.

CRINKLE-BUSH: *Lomatia silaifolia.*

CRINODENDRON (*Tricuspidaria*). *Elæocarpaceæ.* Two Chilean trees with simple toothed alternate or opposite lvs., solitary axillary fls. and leathery capsular frs.; grown for ornament in S. Calif. and sometimes under glass.

dependens. To 30 ft.: lvs. obovate or elliptic, to 2½ in. long: fls. white, about ¾ in. long.

Patagua (*T. lanceolata*). To 30 ft.: lvs. elliptic, to 5 in. long: fls. red, 1¼ in. long, urn-shaped, hanging.

CRINODONNA. Hybrids between Amaryllis and Crinum. **C. Corsii** was raised from seeds of *Amaryllis Belladonna* fertilized by *Crinum Moorei*, produced in Italy and probably not in cult. in N. Amer. but interesting as being an older name for the hybrid known here as Amarcrinum (which see): it is an evergreen autumn-blooming bulbous plant, the many attractive fls. rose-colored.

CRINUM. *Amaryllidaceæ.* Herbaceous plants from a large bulb, grown for the showy lily-like white, pink or red fls., native in trop. and warm-temp. regions in both hemispheres; mostly spring and summer bloomers, grown seldom indoors in the N. because they require much space but popular outdoors in the southernmost states, and two or three of them are hardy in protected ground as far north as N. Y. City. The fls. appear with the lvs. or after the foliage is well grown.

These plants are sometimes called "crinum lilies," although belonging to another family. They are of simple culture and usually remain without change for several years, often forming large clumps. Some of the species are evergreen, the leaves remaining all the year; in others the leaves perish in summer or autumn. The large showy flowers are borne in an umbel topping a strong solid scape or peduncle that arises at or near the ground. If taken up for the winter they are treated as dormant bulbs, or the evergreen species as semi-dormant in pots or boxes. In the early growing season they should have plenty of moisture and fertility. For the most part, crinums are merely planted out-of-doors in the South and allowed to remain.

Propagation is by the natural offsets from the bulbs. Sometimes the plants fruit, and seeds may then be employed although good flowering plants are not to be expected before two or three years.

The crinums bear a general resemblance to amaryllis and hippeastrum but are distinguished by the long slender flower-tube, which equals or exceeds the segments or "petals" of the flower.

amabile. Stout plant with rather small bulb with neck about 1 ft. long: lvs. many, 3–4 in. broad and 3–4 ft. long: fls. 20–30, powerfully fragrant, bright red outside and lighter within, tube 3–4 in. long, segms. nearly linear, ½ in. or so broad: scape 2–3 ft. high. Sumatra.

americanum. SOUTHERN SWAMP CRINUM. Scape 18–24 in., mostly preceding lvs. which are few and very narrow, bearing 2–6 white showy fls. with linear segms. Fla. to Tex.—Winter and spring.

asiaticum. POISON-BULB. Lvs. many and broad, forming a big clump: fls. many, white with greenish tube, fragrant, the very narrow segms. drooping. Trop. Asia.—Frequent in Fla. and Gulf Coast region, Calif.

augustum. Sturdy plant with bulb sometimes 6 in. thick and neck 1 ft. long: lvs. many, 3–4 in. broad: fls. many on scape 2–3 ft. high, differing from *C. amabile* in broader lanceolate segms. and deeper wine-red color outside and milder fragrance. Mauritius, Seychelles.

campanulatum. Lvs. linear, channelled, 3–4 ft.: fls. few, funnelform, light red, tube curved and 2 in. or less long, the bell-shaped limb of similar length and with connivent obtuse segms. S. Afr.

capense: *C. longifolium.*

erubescens. Lvs. many, thin, strap-shaped, slightly scabrous on edges: fls. a dozen or less, salverform, the erect tube 5–6 in. long, segms. half that length and recurving, white inside and purplish outside. Trop. Amer.

fimbriatulum. Lvs. rather narrow, 2–3 ft., ciliate on margins: fls. few, funnelform, greenish-white with red stripe in center of the broad segms., tube 4–5 in. long. Angola (Afr.).

floridanum: probably *C. americanum.*

giganteum. Lvs. lanceolate, 3–4 in. broad at middle, 2–3 ft. long: fls. pure white, mostly 4–6, sometimes more, the slender curved tube to 7 in. long. Trop. Afr.

hybridum: *C. asiaticum.*

Kirkii. Lvs. strap-shaped, 3–4 ft.: fls. a dozen or so, funnelform, tube somewhat curved and greenish and about 4 in. long, the segms. longer and keeled bright red. Zanzibar.

Kunthianum. Lvs. star-shaped, 2–3 ft.: fls. few, salverform, with slender tube 5–8 in., segms. lanceolate and about 2½ in. long, white or purple. Trop. Amer.

longifolium (*C. capense. Amaryllis longifolia*). Lvs. relatively narrow, usually less than 3 in. broad, rough to the finger and sometimes minutely denticulate on the edges: fls. a dozen or less, funnelform, white or pink, about 3 in. across, tube 3–4 in. long and curved, segms. of similar length and 1 in. or less broad. S. Afr. —Probably the commonest crinum in this country, hardy in parts of the N. and much planted S.

Moorei. Larger plant than *C. longifolium* with much broader smooth-edged lvs.: fls. 4 in. or more across, funnelform, rose-red. S. Afr. Var. **album** has white fls.

Powellii. An old hybrid between *C. longifolium* and *C. Moorei*, doubtfully in cult. in this country.

Sanderianum. Lvs. thin, 2 ft. or less long, crisped and denticulate on edges: fls. few, funnelform, white with red keels, the curved tube 5–6 in. long, segms. less than 1 in. broad and 3–4 in. long and not spreading. Trop. Afr.

scabrum. Lvs. narrow, 2 in. or less, with rough edges: fls. few, funnelform, white with crimson keels, the greenish curved tube 3–5 in. long and limb shorter. Trop. Afr.

virginicum: a name for a hort. var.

zeylanicum. Lvs. broad, often 4 in., with slightly rough edges: fls. many, funnelform, fragrant, whitish with broad red keels, the curved tube 3–4 in. or more long, segms. 1 in. broad. Trop. Asia and Afr.

CRISTARIA. *Malvaceæ.* Herbs, often prostrate, native in Chile and Peru, with lobed or dissected lvs. and usually violet fls. solitary or in racemes; one species intro. in S. Calif.

glaucophylla. To 2 ft. or more, glaucous: lvs. 3-lobed with middle lobe much larger than lateral ones, to 2¼ in. long, broadly toothed: fls. ¾ in. long, in panicles. Chile.

CRITHMUM. *Umbelliferæ.* One species, native on seashores of Eu., is sparingly grown as a salad plant or for ornament. **C. maritimum.** SAMPHIRE. Per. 1–2 ft.: lvs. 2–3-ternate into linear fleshy glaucous segms. ½ in. long: fls. very small, white or yellowish, in compound umbels: fr. ovoid, ¼ in. long.—Does best in sandy or gravelly soil. Propagated by seed sown as soon as ripe, and by division of roots.

CROCOSMIA. *Iridaceæ.* One African cormous herb, blooming in autumn, and grown like gladiolus. In the N. the corms should be set out after frost and stored over winter in peat or sphagnum. Propagated by offsets or seeds. **C. aurea.** COPPERTIP. To 4 ft., the sts. branching and with few lvs.: fls. bright orange-yellow, to 2 in long, in panicled spikes. See *Tritonia.*

CROCUS. *Iridaceæ.* Spring- and autumn-blooming cormous herbs with no evident st., basal grass-like lvs. and white, yellow or lilac fls., the expanded segms. raised above ground by the long slender perianth-tube.

Crocuses should be planted 3–4 inches deep in good well-drained soil. As new corms form on top of the old ones and so raise the plants out of the soil, it is well to replant every few years. Propagated by offsets and seeds, the latter blooming in about three years. They are of simple culture and popular; most of them are hardy, but a winter mulch is desirable.

aerius. Fls. lilac, segms. to 1 in. long, throat yellow, in winter. S. E. Eu.

Aitchisonii: *C. speciosus* var.

asturicus. Fls. lilac, segms. 1½ in. long, in autumn. Spain.

aureus: *C. mœsicus.*

Balansæ. Fls. orange-yellow, segms. to 1¼ in. long, outer tinged brown on back, in spring. Smyrna.

biflorus. Fls. tinged with purple, segms. 1½ in. long, the outer with 3 stripes of purple, throat tinged yellow, in spring. Italy to S. W. Asia. Var. **pusillus** is a smaller-fld. form and var. **Weldenii** has uniform slaty-purple segms.

Boryi. Fls. white or tinged lilac, segms. to 1½ in. long, throat yellow, in autumn. Greece. Var. **marathoniseus** has less divided style-branches. Var. **Tournefortii** has lilac fls.

byzantinus (*C. iridiflorus*). Fls. purple, segms. to 2 in. long, the inner ones lilac or white, in autumn. S. E. Eu.

Cambessedesii. Fls. lilac to white, segms. to 1 in. long, outer buff lined with purple, in autumn. Majorca, Minorca.

cancellatus. Fls. white or lilac, segms. to 1¾ in. long, throat yellow, in autumn. Asia Minor. Var. **cilicicus,** fls. lilac veined with purple.

caspius. Fls. white, segms. to 1¼ in. long, throat yellow, in autumn. Near Caspian Sea.

chrysanthus. Fls. orange-yellow, segms. to 1¼ in. long, in winter. Asia Minor.

etruscus. Fls. lilac or cream-colored, segms. to 1½ in. long, throat yellow, in winter. Italy.

Fleischeri. Fls. white striped lilac, segms. to 1¼ in. long, throat yellow, in winter. Asia Minor.

hadriaticus. Fls. pure white, segms. 1½ in. long, throat white or purple, bearded, in autumn. Greece. Var. **chrysobelenicus** has yellow throat. Var. **Wilhelmii** has purple markings.

hyemalis. Fls. white striped with purple, segms. 1½ in. long, throat yellow, in spring. Palestine.

Imperati. Fls. lilac or white with 3 dark purple stripes on outside, segms. 1½ in. long, in very early spring. Italy. Var. **albus** has white fls.

iridiflorus: *C. byzantinus.*

karduchorum. Fls. lilac, segms. to 1¼ in. long, in autumn. S. W. Asia.

Korolkowi. Fls. orange-yellow, segms. 1 in. long, in spring. S. E. Eu.

lævigatus. Fls. white, segms. 1 in. long and outer striped lilac, in autumn. Greece. Var. **Fontenayi** is tinted buff and later blooming.

longiflorus. Fls. bright lilac, segms. 1½ in. long, throat yellow, slightly bearded, in autumn. S. Eu. Var. **melitensis,** fls. veined yellow at base.

marathoniseus: *C. Boryi* var.

medius. Fls. bright lilac, segms. to 2 in. long, throat whitish, in autumn. S. France, Italy.

minimus. Fls. violet, segms. to 1 in. long, outer buff lined with purple outside, in spring. Corsica, Sardinia.

mœsicus (*C. aureus*). Fls. bright yellow, segms. 1½ in. long, in spring. S. E. Eu., Asia Minor.

nudiflorus. Fls. lilac, segms. to 2 in. long. S. W. Eu.

obovatus: a form of *C. vernus.*

ochroleucus. Fls. pale cream tinged with orange, segms. 1½ in. long, throat orange, slightly bearded, in autumn. Asia Minor.

Olivieri. Fls. orange-yellow, segms. to 1½ in. long, in spring. Greece to Asia Minor.

pulchellus. Fls. bright lilac, indistinctly striped, segms. 1½ in. long, throat bright yellow, in autumn. Greece to Asia Minor.

purpureus: *C. Sieberi* var.

Salzmanni. Fls. lilac, segms. to 2 in. long, throat yellowish, bearded, in autumn. Morocco. Var. **erectophyllus,** fls. clear purple-lilac.

sativus. SAFFRON C. Fls. lilac or white, segms. to 2 in. long, throat bearded, in autumn. Asia Minor. Var. **Pallasii** has a yellow throat. Var. **Cartwrightianus** is striped.

Sieberi. Fls. lilac, segms. 1½ in. long, throat yellow, in spring. Greece, Crete. Var. **purpureus** had darker purple fls.

speciosus. Fls. lilac tinged with purple, segms. 2 in. long, in autumn. S. E. Eu., Asia. Var. **Aitchisonii** is larger and has pale bluish-lilac fls. Var. **albus** has white fls. Var. **globosus** has dark blue fls.

susianus. CLOTH-OF-GOLD C. Fls. bright orange-yellow tinged with brown outside, segms. 1½ in. long, in spring. Crimea.

tauri. Fls. pale purple, to 1¼ in. long, throat yellow, in spring. Asia Minor.

Tomasinianus. Fls. pale reddish-blue, sometimes with dark spot at tip, segms. 1½ in. long, in spring. Dalmatia, Serbia.—Like *C. vernus,* but throat not bearded.

Tournefortii: *C. Boryi* var.

vernus. Fls. lilac or white often striped with purple, segms. 1½ in. long, throat bearded, in spring. Eu.

versicolor. Fls. purple sometimes striped with darker purple, segms. 1½ in. long, throat whitish or yellowish, in spring. S. France.

vitellinus. Fls. orange-yellow, segms. to 1 in. long and outer tinged brown, in winter. Asia Minor. Var. **graveolens** has outer segms. tinged black.

zonatus. Fls. rose-lilac veined with purple and spotted inside with orange, segms. 2 in. long, throat yellow, bearded, in autumn. Cilicia.

CROCUS, AUTUMN-: *Colchicum.*

CROSNES DU JAPAN: *Stachys Sieboldii.*

CROSSANDRA. *Acanthaceæ.* Herbs and shrubs with opposite or whorled lvs. and white, yellow or red tubular fls. with split limb, borne in dense bracted spikes; native in tropics of Old World. Grown under glass or out-of-doors in warm countries and the tropics. Propagated by cuttings over heat.

infundibuliformis (*C. undulæfolia*). Shrub to 3 ft.: lvs. ovate to lanceolate, to 5 in. long, somewhat wavy-margined: fls. scarlet-orange, ¾ in. long and 1 in. across, in an angled spike. India.

undulæfolia: *C. infundibuliformis.*

CROSS-VINE: *Bignonia capreolata.*

CROSSWORT: *Crucianella.*

CROTALARIA. RATTLE-BOX. *Leguminosæ.* A very large genus of herbs and shrubs mostly native in trop. regions, a few grown as cover- or green-manure crops in the S. and sometimes for ornament under glass: lvs. simple or compound: fls. papilionaceous, usually in racemes: pods inflated. Propagated by seeds which should first be soaked in warm water, and the shrubby species by cuttings under glass.

anagyroides. Shrub to 8 ft.: lvs. of 3 ovate or lanceolate lfts.: fls. yellow with darker lines, ¾ in. across: pods 1½ in. long. Trinidad, Venezuela.

candicans. Shrub covered with silky brown hairs: lvs. ovate-oblong, acute: fls. yellow, 1 in. and more long: pods to 1¼ in. long. India.

capensis. Shrub to 5 ft.: lvs. of 3 obovate obtuse lfts.: fls. bright yellow, 1 in. and more long. S. Afr.

laburnifolia. Low shrub: lvs. of 3 obovate-oblong acute lfts.: fls. bright yellow, 1 in. long: pods to 2 in. long. Trop. Asia.

lanceolata. Herb to 3 ft.: lvs. of 3–5 narrow-lanceolate acute lfts.: fls. yellow veined with purple, ⅓ in. long: pods 1 in. or more long. S. Afr.

retusa. Ann. to 3 ft., pubescent: lvs. oblanceolate, obtuse: fls. yellow with variegated standard, to 1 in. long: pods to 1½ in. long. Asia; nat. in trop. Amer.

Retzii. Woody per. to 8 ft.: lvs. obovate, obtuse: fls. yellow, 1 in. long: pods 2 in. long. E. Indies.

striata. Woody per. to 8 ft.: lvs. of 3 elliptical obtuse lfts.: fls. yellow striped with brown, ½ in. long: pods 1½ in. long. Tropics.—Much planted in Fla. for green-manuring.

CROTON: *Codiæum.*

CROWBERRY: *Empetrum.* Broom: *Corema Conradii.*

CROWFOOT: *Ranunculus.*

CROWN: corona; also, as a common-language word, that part of the stem at the surface of the ground; also a part of a rhizome with a large bud, suitable for use in propagation.

CROWN IMPERIAL: *Fritillaria imperialis.*

CROWN-OF-THORNS: *Euphorbia splendens.*

CRUCIANELLA. Crosswort. *Rubiaceæ.* Ann. and per. herbs from the Medit. region and W. Asia, with opposite or whorled lvs. and small tubular 4–5-lobed fls. having bracts at base; grown in rock-gardens where they thrive in partial shade. Propagated by division and by seeds.

herbacea. Ann. to 1 ft. or more: lvs. ovate-oblong or upper linear: fls. in dense linear spikes to 2 in. long. Egypt.

stylosa. Prostrate ann. with sts. to 9 in.: lvs. lanceolate: fls. deep rose, in globose heads ½ in. across, the styles long-exserted. Persia.

CRUCIFERÆ. Mustard Family. A large natural assemblage of herbaceous plants, a few of them subshrubs, probably upwards of 1800 species, distributed mostly in temp. and cold regions. They are of various habit, but agree in general in the 4-sepalled and 4-petalled fls. and stamens commonly 6 of which 2 are shorter than the others, and in the characteristic dry pod (silique when elongated, silicle when short and broad): lvs. prevailingly alternate, entire, dissected or essentially compound: fls. white, yellow, orange, lilac, purple, mostly not large but abundant. The family abounds in peppery and piquant qualities. It yields useful plants to the flower-garden and the vegetable-garden, and many of the species are cosmopolitan weeds. Genera entered in this book are Æthionema, Alyssum, Anastatica, Arabis, Armoracia, Aubrieta, Barbarea, Berteroa, Biscutella, Brassica, Cardamine, Cheiranthus, Cochlearia, Coronopus, Crambe, Dentaria, Diplotaxis, Draba, Eruca, Erysimum, Hesperis, Hutchinsia, Iberis, Ionopsidium, Isatis, Kernera, Lepidium, Lesquerella, Lobularia, Lunaria, Malcomia, Mathiola, Nasturtium, Peltaria, Petrocallis, Raphanus, Ricotia, Schivereckia, Schizopetalon, Stanleya, Thelypodium, Thlaspi, Vesicaria.

CRUPINA. *Compositæ.* Ann. herbs with pinnately cut lvs. and long-stalked few-fld. purple heads of ray- and disk-fls.; pappus of bristles and scales; native from S. Eu. to W. Asia. Sometimes grown in flower-gardens.

vulgaris (*Centaurea Crupina*). To 2 ft.: lvs. cut into fine linear segms.: heads 3–5-fld., the fls. scarcely longer than the pale acuminate bracts of involucre. S. Eu.

CRYOPHYTUM. *Aizoaceæ.* One of the genera separated from the old genus Mesembryanthemum: ann. and bien., often prostrate: lvs. opposite or scattered or sometimes alternate at base of plant: fls. solitary, white, yellow, or red, the petals many and very narrow; stigmas usually 5. Several species, in S. Afr., Medit. region, S. W. Asia, Calif., one of them commonly grown. For cult. see *Mesembryanthemum.*

Aitonis (*M. Aitonis. M. angulatum. M. lanceolatum*). Decumbent: lvs. lanceolate, flat, somewhat obtuse, the peduncles and calyx with shining watery pustules: fls. white. S. Afr.

crystallinum (*M. crystallinum*). Ice-Plant. Ann., readily grown from seeds in warm sunny exposure, fleshy, sts. spreading and prostrate, plant covered with glistening watery pustules: early lvs. broad-ovate, to 6 in. long and 3 in. or more broad, eventually perishing: lvs. on flowering shoots much smaller: fls. small, whitish to rose. S. Afr., Medit. region, coasts of S. and Lower Calif.—Grown in window-gardens and elsewhere for the glistening herbage, and sometimes used as a pot-herb.

nodiflorum (*M. nodiflorum*). Ann., somewhat crystalline: lvs. linear, nearly cylindric, to 1 in. long: fls. very small, white, axillary. S. Afr., Medit. region, S. W. Asia., S. Calif.

CRYPTANTHA. *Boraginaceæ.* Ann. hispid herbs mostly in W. N. Amer., with alternate, simple and entire lvs. and inconspicuous white fls. in coiled spikes or racemes, the throat of corolla commonly closed by scales; rarely sown in the wild-garden in the regions where they grow.

barbigera (*Eritrichium barbigerum. Krynitzkia barbigera*). To 1 ft., covered with long whitish stiff hairs: lvs. broadly linear, to 1½ in. long: fls. ⅕ in. long, calyx-lobes to ⅛ in. long. Utah to Calif.—The plant cult. as *C. barbigera* may be *C. intermedia.*

intermedia. To 1 ft., covered with spreading white hairs: lvs. lanceolate or linear, to 1 in. long: fls. ⅙ in. across, calyx-lobes 1/12 in. long. S. Calif.

CRYPTANTHUS. *Bromeliaceæ.* Epiphytic stoloniferous S. American herbs with flattened rosettes of stiff prickly-margined lvs. and white fls. borne in a little head amongst the foliage; grown as foliage plants under glass. Cult. as for *Bromeliaceæ.*

acaulis (*C. undulatus. Tillandsia acaulis*). Lvs. to 6 in. long and 1½ in. wide, with wavy prickly margins, in shades of green, white-scurfy beneath; small foliage plant in many vars. Brazil.

Beuckeri. Lvs. to 5 in. long and 2 in. wide, narrowed to a petiole about 2 in. long, brownish-green or rosy spotted or striped with light green. Brazil.

undulatus: *C. acaulis.*

zonatus. Lvs. to 9 in. long and 1½ in. wide, crinkly, with transverse bands of white, green or brown above, and white-scurfy beneath. Brazil.

CRYPTOCARYA (*Bellota*). *Lauraceæ.* Trees and shrubs mostly of the southern hemisphere, with leathery lvs. and small bisexual fls. in panicles, and small dry fr. inclosed in the calyx; sometimes planted in S. Calif.

Miersii. Tree to 50 ft.: lvs. opposite, oblong or oblong-ovate, entire, thin, glabrous, shining above, veins prominent beneath. Chile.

Peumus: *C. rubra.*

rubra (*C. Peumus*). Tree 50–60 ft.: lvs. nearly opposite or alternate, ovate, thick, glabrous, glaucous beneath. Chile.

CRYPTOGRAMMA. ROCK-BRAKE. *Polypodiaceæ.* Small alpine and boreal ferns of both hemispheres, the lvs. of two types, both compound, the segms. of the fertile ones pod-like due to the folding back of the edges over the fruit-dots; sometimes in rock-gardening and similar undertakings. See *Ferns.*

acrostichoides. AMERICAN PARSLEY-FERN. Lvs. clustered, many, on straw-colored stalks to 6 in. long, 2–3-pinnate, fertile with linear segms. Lake Huron and Lake Superior northward, southward in western mts.

densa: *Cheilanthes densa.*

Stelleri (*Pellæa gracilis*). SLENDER ROCK-B. Differs from *C. acrostichoides* in the creeping rootstocks, scattered lvs. and fertile lvs. with broader segms. High north in N. Amer. and Asia.

CRYPTOLEPIS. *Asclepiadaceæ.* Twining or erect shrubs in warm parts of Old World, one sometimes planted in Calif.: lvs. opposite: fls. in terminal or axillary umbel-like cymes or sometimes practically solitary; corolla tubular, with spreading limb, crown of 5 fleshy lobes: follicles smooth, mostly terete and spreading.

longiflora. Erect, 3 ft.: lvs. willow-like, long-pointed, to 5 in. long, clustered toward top of st., often tinted red: fls. white, among the foliage or just above it, very slender, 1 in. or more long. Nativity in doubt.

CRYPTOMERIA. *Pinaceæ.* One Japanese evergreen tree of pyramidal habit, magnificent when mature. **C. japonica.** To 125 ft. or more: lvs. to 1 in. long, keeled on both sides, bluish-green: staminate fls. yellow, in short racemes: cones globose, to 1 in. across, having thick wedge-shaped scales with pointed processes at apex. Hardy at Washington and somewhat northward, in S. New England the foliage usually browning in winter but may recover following season; grown mostly in warmer climates. Some of the hort. vars. are: **araucarioides,** branchlets drooping, lvs. small, bright green; **compacta,** of compact habit; **cristata** (var. *monstrosa*), branches cockscomb-like; **dacrydioides,** lvs. brownish, closely set; **elegans,** low tree with drooping branchlets and longer lvs.; **Lobbii,** compact form with lighter green lvs.; **nana,** dwarf, spreading or procumbent form; **pungens,** compact form with stiff sharp-pointed dark green lvs.; **spiralis,** shrub with lvs. twisted spirally. A form from China is var. **sinensis,** a tree of looser habit and longer lvs. For cult. see *Conifers.*

CRYPTOSTEGIA. RUBBER-VINE. *Asclepiadaceæ.* Three woody vines from trop. Afr. and Madagascar, with opposite large lvs. and large funnel-shaped fls. in terminal clusters, the calyx with many glands at base; follicles winged or angled; juice furnishes caoutchouc.

They are grown under glass in loamy soil, and in the open in warm countries as southern Florida. Propagated by cuttings over bottom heat.

grandiflora. Lvs. oblong, to 4 in. long, thick and glossy: fls. purplish, about 2 in. across. Afr.; cult. in India.

madagascariensis. Differs in its lvs. being pubescent below and the corolla-segms. of the pink or whitish fls. divided. Madagascar.

CRYPTOSTEMMA. *Compositæ.* Tomentose herbs with toothed or pinnatifid lvs. and solitary fl.-heads, the ray-fls. yellow and disk darker; pappus scale-like. They may be grown in the flower-garden.

calendulaceum (*Arctotis calendulacea*). Ann. to 2 ft. or sometimes prostrate: lvs. pinnatifid: fl.-heads 1 in. or more across. S. Afr., Australia.

CTENANTHE. *Marantaceæ.* Brazilian per. herbs with basal and st.-lvs. and fls. borne under bracts in terminal spikes or racemes; greenhouse foliage plants requiring the same treatment as Calathea, and differing in technical botanical characters.

Kummeriana. To 1½ ft., stoloniferous; lvs. 6 in. long and 2½ in. wide, green veined with white above, purple beneath.

Lubbersiana (*Phrynium Lubbersi*). To 2 ft.: lvs. to 9 in. long and 2½ in. wide, green variegated with yellow above, pale green beneath.

Oppenheimiana (*Calathea Oppenheimiana*). To 3 ft.: lvs. to 1½ ft. long and 5 in. wide, light green above, purple beneath.

setosa (*Phrynium setosum*). To 3 ft., stoloniferous: lvs. to 1½ ft. long and 4 in. wide, green.

CUBEB: *Piper Cubeba.*

CUCKOO-FLOWER: *Cardamine pratensis, Lychnis Flos-cuculi.*

CUCKOO-PINT: *Arum maculatum.*

CUCUMBER (*Cucumis sativus*). Fruit of an annual tendril-bearing vine, used for pickles in the young state or when small and also extensively eaten raw as a salad and in some countries from the hand without dressing. The cucumber is characteristically a summer plant, being frost-tender and making rapid growth. It requires a warm quick soil, with readily available fertility. The only particular difficulty in its culture out-of-doors is to control certain diseases and insects, and for the treatment of them the grower should have the latest issues of books and bulletins devoted to the subject. The striped beetle, which is most damaging when the plants are young, may be kept away in the home garden by covering the hills tightly at first with mosquito-netting; in fields the plants may be sprayed with an arsenical or nicotine dust. Some of the commoner diseases may be checked with bordeaux mixture.

Cucumbers are grown directly from seeds, and commonly planted in the field as soon as the weather is warm and reliable. They do not transplant well unless turned out of pots, berry-boxes, or started on inverted sods. Four or five plants are usually left at each stand or hill after the ravages of early pests are past; the hills are about 4 x 4 feet apart for early kinds and 4 x 6 feet for the later longer-running varieties. One ounce of seed plants fifty or more hills. Well-rotted manure may be worked into the hills if the garden soil is not fertile or well prepared. One hundred or more bushels of pickling cucumbers should be produced on an acre. The vines should be picked over frequently to prolong the bearing life.

The White Spine group of varieties is the main reliance for both field and garden work, but there are special small pickling kinds and also early varieties. The small pickling cucumbers are sometimes called gherkins; the West Indian or bur cucumber is another species, *Cucumis Anguria*, which is more grown in the United States for ornament than for pickles.

The growing of cucumbers under glass, or so-called forcing, is of two very distinct types, — the growing of a commercial crop of the ordinary or White Spine type and mostly following a winter crop of lettuce or other stock, and the raising of the long nearly or quite spineless English frame or forcing cucumber as a regular winter crop and usually for home use. The former or commercial practice usually produces the crop in spring and early summer. The plants are started in pots about a fortnight before the house is to be ready for them; they are then transplanted to the beds, and in six to eight weeks thereafter the plants should be bearing. They are set in rows about 3 feet apart, and 18–24 inches in the row. The vines are trained to cords or wires, so that the fruit hangs. Good soil and plenty of water are required. A good plant yields 100 or more cucumbers, if it is stocky and kept free of pests and diseases.

English frame cucumbers, as Telegraph, Sion House, Jasper Queen and others, may be grown for winter crop being started in autumn 80–100 days before fruit is wanted, or for spring and summer crop in frames and started in February or March. It is commonly necessary to hand-pollinate in winter when bees are not available.

CUCUMBER, BUR-: *Sicyos angulatus*. **Mock-**: *Echinocystis lobata*. **-Root, Indian**: *Medeola virginiana*. **Squirting-**: *Ecballium Elaterium*. **Star-**: *Sicyos angulatus*. **-Tree**: *Magnolia acuminata* and *macrophylla*. **Wild-**: *Echinocystis lobata*.

CUCUMIS. *Cucurbitaceæ*. Herbs of Afr. and S. Asia, ann. tender running species of which four are grown with us for the edible or interesting frs.: mainly monœcious: lvs. angled, lobed or divided: tendrils simple: fls. yellow or whitish, of good size, solitary in the axils or somewhat clustered.

Anguria (*C. grossulariæformis. C. erinaceus*). West India or Bur Gherkin. Sts. slender, angled, rough: lvs. to 3½ in. long, with 3 main rounded lobes and open sinuses: fr. ovoid or oblong, about 2 in. long, prickly, on long sts. Fla. and Tex., far S.—Frs. curious and used for pickles; the gherkins of mixed pickles are cucumbers; sometimes called "gooseberry gourd."

Chito: *C. Melo* var.

Conomon: *C. Melo* var.

dipsaceus. Hedgehog or Teasel Gourd. Slender, sts. prickly: lvs. broad-ovate to reniform-ovate, not lobed: fr. a hard bristly bur 1–2 in. long. Arabia.—Grown for curiosity and ornament.

Dudaim: *C. Melo* var.

erinaceus: *C. Anguria*.

flexuosa: *C. Melo* var.

grossulariæformis: *C. Anguria*.

Melo. Melon (which see), Muskmelon. Sts. trailing, soft-hairy: lvs. round-ovate to nearly reniform, obtuse, angled but not lobed as a rule: fls. about 1 in. across: fr. globular to oblong, pubescent or becoming glabrous, in many sizes, usually musky-flavored. Probably S. Asian, now widely cult. in many forms in N. Amer., mostly under the erroneous name "cantaloupe" which is properly applied to a race (var. **cantalupensis**) with hard and scaly or warty rinds and seldom grown with us. Var. **Chito**, Mango Melon, lvs. mostly smaller, fr. size and shape of lemon or orange and sometimes called "orange melon" and "lemon-cucumber," flesh white and firm and not fragrant, employed in the making of preserves and pickles. Var. **Conomon**, Oriental Pickling Melon, lvs. tending to be oblong and somewhat lobed on sides, fls. large, fr. globular to oblong-cylindric to club-shaped and sometimes constricted midway turban-shaped, flesh white or green and not fragrant, used in preserving; little grown by Americans. Var. **Dudaim** (*C. odoratissimus*), Dudaim Melon, plant small, fr. size of orange and more or less flattened endwise, marbled, highly perfumed and for this purpose sometimes grown. Var. **flexuosus**, Snake or Serpent Melon, fr. 1½–3 ft. or more long and 3 in. or less thick, mostly crooked or coiled; grown as a curiosity and perhaps used in preserves. Var. **inodorus**, Winter or Cassaba Melon, very strong vine, lvs. large and sometimes prominently lobed, fls. large, fr. large and only mildly scented, keeping late.

odoratissimus: *C. Melo* var. *Dudaim*.

sativus. Cucumber (which see). Rough-hairy trailing vine: lvs. triangular-ovate, pointed, often somewhat 3-lobed: fls. 1½ in. or less across, short-stalked: fr. globular to oblong to short-cylindric, prickly. S. Asia.—Cult. in many kinds for eating raw and for pickles; some of the small kinds are known as "gherkins" (see *C. Anguria*). Var. **anglicus**, English Forcing Cucumber, very strong grower, lvs. very large, fr. to 2 and 3 ft. long and nearly or quite spineless.

CUCURBITA. *Cucurbitaceæ*. Monœcious tendriliferous herbaceous plants, running and commonly rooting except in certain "bush" cultural vars., grown mostly for the great edible frs. but some of them for ornament and curiosity, with per. or ann. roots: lvs. large, simple but variously angled or lobed: fls. large, yellow, solitary or the staminate perhaps fascicled: eastern and western hemisphere. The origin of pumpkins and squashes is yet undetermined. There is a native gourd in Tex., *C. texana*, that may have some relation to prehistoric stocks; there is another, *C. okeechobeensis*, in the Everglades of Florida but it is not closely related to the cult. kinds. See *Gourd* and *Pumpkin*.

ficifolia: (*C. melanosperma.*) Malabar Gourd. Long-running, per. in warm countries: lvs. orbicular-ovate to nearly reniform, lobed and with obtuse sinuses or merely sinuate: corolla-lobes large and spreading: fr. oblong to nearly spherical, to 12 in. long, green with white stripes, flesh white; seeds black or nearly so. E. Asia.—Grown for ornament.

fœtidissima (*C. perennis*). Calabazilla. Per., long-running: lvs. cordate-triangular, stiff, grayish, crenate: fls. large: fr. size and shape of orange, green and yellow, not edible. Neb. to Calif. and Mex.

maxima. Autumn and Winter Squash. Ann. vine, only slightly prickly: lvs. orbicular or reniform, very obtuse, mostly not lobed: corolla-lobes soft and spreading or drooping and mostly obtuse: fr. spherical to oblong or turban-shaped, often very large, its st. spongy and not ridged nor prominently enlarged at apex. Nativity unknown.—Here belong Hubbard, Boston Marrow, Mammoth Chile, and similar squashes. Var. **turbaniformis** comprises the turban squashes, a "squash-within-a-squash."

melanosperma. *C. ficifolia*.

moschata. Cushaw, Canada and Winter Crookneck Pumpkins. Ann. vine, rather soft-hairy: lvs. broad-ovate to nearly orbicular-ovate, for the most part not lobed, often with whitish marks: corolla with wide spreading crinkly mostly acute lobes and often very large, calyx-lobes often leafy: fr. of many shapes, commonly oblong or big-crookneck, autumn and winter, its st. angled and much expanded at top. Nativity unknown.—Includes Sweet Potato, Quaker Pie, Japanese Pie pumpkins (or squashes).

Melopepo: *C. Pepo* var.

ovifera: *C. Pepo* var.

Pepo. Summer and Autumn Pumpkins. Harsh ann. with prickly sts. and petioles: lvs. triangular or ovate-triangular, often prominently lobed: corolla-lobes erect and sharp-pointed: fr. of many kinds, mostly orange, furrowed, mostly not long-keeping, its st. strongly angled and enlarging upward. Nativity unknown.—Here are found the common field pumpkins, Vegetable Marrow, and others. Var. **Melopepo** (*C. Melopepo. C. Pepo* var. *condensa*). Bush Pumpkins or Squashes. Mostly summer kinds, not running, including Pattypan, Scallop, Summer Crookneck, Cocozelle. Var. **ovifera.** Yellow-flowered Gourds (as distinguished from the white-fld. or Lagenarias). Running vines, producing many forms and colors of small hard-shelled ornamental durable frs.

perennis: *C. fœtidissima.*

CUCURBITACEÆ. Gourd Family. Cucurbits. An important hort. family including plants grown for edible frs. and as ornamental vines, as pumpkins, squashes, gourds, melons, watermelon, cucumbers and gherkins, chayote. The family includes some 90 genera and probably 700 species, mostly of trop. or subtrop. regions. The family comprises herbs and erect shrubs; but the hort. kinds are herbaceous and most of them tender annuals and all but one (Ecballium) are naturally running tendril-bearing vines. The plants of the Cucurbitaceæ are monœcious or diœcious: lvs. alternate, palmately veined, lobed or dissected: fls. prevailingly yellow or greenish, gamopetalous or the petals 5, the corolla sometimes large and showy but of short duration; stamens mostly 3: fr. a pepo, indehiscent or irregularly bursting, mostly fleshy in the cult. kinds and often large and edible. The species are of the easiest cult., but the pumpkins, gourds, melons and cucumbers are frost-tender and must make their growth rapidly in the northern parts of the country, requiring a warm quick soil. They come from seeds. The genera of Cucurbitaceæ included in this Hortus are Abobra, Benincasa, Bryonia, Bryonopsis, Citrullus, Coccinea, Cucumis, Cucurbita, Cyclanthera, Ecballium, Echinocystis, Lagenaria, Luffa, Melothria, Momordica, Sechium, Sicana, Sicyos, Trichosanthes.

CUDRANIA: *Vanieria.*

CULINARY HERBS are those employed in a secondary way in cookery, as for flavoring and seasoning, and also as garnishes for viands. They do not constitute a single cultural group. Some of the plants falling under this denomination are anise, caraway, chervil, chive, coriander, dill, fennel, parsley, as well as the sweet herbs, which are mostly of the mint family.

CULTIGEN: plant or group known only in cultivation, with no determined nativity; presumably originating under domestication; contrast with indigen.

CULTIVAR: a variety or race that has originated and persisted under cultivation, not necessarily referable to a botanical species, and which is of botanical or taxomonic importance.

CULVERS-ROOT: *Veronicastrum virginicum.*

CUMINUM. *Umbelliferæ.* One ann. herb native in the Medit. region, the frs. of which are used as flavoring. **C. Cyminum.** Cumin. To 6 in.: lvs. cut into thread-like divisions: fls. small, white or rose, in compound umbels: fr. narrowly oblong. Propagated by seeds in spring.

CUNEATE: wedge-shaped; triangular, with the narrow end at point of attachment, as of leaves or petals.

CUNILA. *Labiatæ.* Tufted per. herbs or small shrubs with small opposite lvs. and white or purplish 2-lipped fls. in whorls, the 2 stamens long-exserted; grown in the border and hardy.

mariana: *C. origanoides.*

origanoides (*C. mariana*). Maryland Dittany. Stone-Mint. To 1 ft.: lvs. ovate, to 1½ in. long, toothed, nearly sessile: fls. purplish-pink, ¼ in. long, in terminal cymose cluster, early autumn. S. N. Y. to Fla. and Tex.

CUNNINGHAMIA (*Belis*). China-Fir. *Pinaceæ.* Two evergreen trees native in E. Asia, allied to Cryptomeria, having stiff sharp-pointed flattened linear-lanceolate lvs. with broad white bands beneath, fls. in terminal clusters, and roundish cones with thick pointed scales. For cult. see *Conifers.* To be grown only in the lower S. and Calif., although in sheltered places *C. lanceolata* may persist as far north as Pa.

Konishii. To 100 ft.: lvs. to 1 in. long: cones to 1 in. long. Formosa.

lanceolata (*C. sinensis*). To 80 ft.: lvs. to 2½ in. long: cones to 2 in. long. China.

sinensis: *C. lanceolata.*

CUNONIACEÆ. Cunonia Family. Trees and shrubs of 21 genera native in the southern hemisphere, having opposite or whorled, entire or pinnate lvs., small bisexual or unisexual fls. with 4–5 sepals and petals, 4 or more stamens, 2-celled superior ovary, and usually capsular frs. Ackama, Callicoma, Ceratopetalum and Weinmannia are occasionally planted in Calif.

CUPANIA. *Sapindaceæ.* Trees and shrubs bearing alternate pinnate lvs., small fls. in panicles, and capsular frs.; one species sometimes planted for ornament in warm climates. They are native in trop. and semi-trop. regions, mostly in Amer.

anacardioides. Tree to 40 ft.: lvs. of 6–10 leathery very obtuse entire lfts. to 4 in. long: fls. white: fr. leathery, 3-lobed, about ⅔ in. across. Australia.

Cunninghamii: *Diploglottis Cunninghamii.*

sapida: *Blighia sapida.*

CUPHEA (*Parsonsia*). *Lythraceæ.* American herbs or shrubs with alternate or whorled lvs., irregular mostly axillary fls. that are often showy or in abundance, with corolla-like often gibbous or spurred calyx, the petals 2 or 6 on the calyx-tube or lacking, and capsular fr.

Cupheas are greenhouse subjects, or grown out-of-doors in the South. As glasshouse plants they are mostly treated as tender annuals and are of easy cultivation. Propagated by seeds or the shrubby kinds by cuttings.

compacta: *C. miniata* var.

cyanea (*C. strigulosa*). To 6 ft.: lvs. ovate, to 3 in. long: fls. with red and yellow calyx and 2 small petals, in racemes. Mex.

heterophylla. To 2 ft.: lvs. mostly ternate, ovate to oblong-lanceolate, to 4 in. long: fls. with purplish or reddish calyx and 6 red unequal petals, in racemes. Mex.

Hookeriana. To 2½ ft.: lvs. lanceolate or linear-lanceolate, to 4 in. long: fls. with reddish calyx, 2 large deep purple petals and 4 very small petals, in terminal racemes. Mex.

hyssopifolia. To 2 ft.: lvs. linear to lanceolate, about ¼ in. long, crowded: fls. with green calyx and 6 purple, pink or white petals, in axils. Mex. and Guatemala.

ignea: *C. platycentra.*

jorullensis (*C. tricolor*). To 3 ft.: lvs. lanceolate to ovate, to 2 in. long: fls. with red and green calyx and small whitish petals, in racemes. Mex.—The plant grown under this name may be *C. micropetala.*

lanceolata (*C. Zimapani. C. silenoides*). Sticky ann. to 4 ft.: lvs. lanceolate, to 3 in. long: fls. with purplish calyx and 2 large purple petals and 4 smaller ones, solitary. Mex.

Llavea: *C. miniata.*

micropetala. To 2 ft.: lvs. lanceolate, to 5 in. long: fls. with yellow and red calyx and 6 small petals, in terminal leafy racemes. Mex.

miniata (*C. Llavea*). Shrubby: lvs. ovate, to 3 in. long: fls. with green and purplish calyx and 2 large bright red petals, in racemes. Mex. Var. **alba** has white fls. Var. **compacta** is a compact form.

platycentra (*C. ignea*). CIGAR-FLOWER. To 1 ft.: lvs. lanceolate or broader, to 2½ in. long: fls. with slender bright red calyx with white mouth and dark ring at end, without petals, solitary. Mex.

Roezlii. To 3 ft.: lvs. elliptic-lanceolate, to 3 in. long: fls. with cinnabar-red and yellowish calyx and 2 very small petals, in racemes. Mex.

silenoides: *C. lanceolata.*

strigulosa: *C. cyanea.*

tricolor: *C. jorullensis.*

viscosa. Ann. to 1½ ft.: lvs. ovate-lanceolate, to ¾ in. long: fls. with 2 deep purple petals and 4 smaller whitish petals, in sticky-pubescent racemes. Mex.

Zimapani: *C. lanceolata.*

CUP-FLOWER: *Nierembergia.*

CUPIDS-DART: *Catananche.*

CUP-PLANT: *Silphium perfoliatum.*

CUPRESSUS. CYPRESS. *Pinaceæ.* Evergreen trees or shrubs with small scale-like lvs. or linear in young plants, minute fls. and globular cones with woody scales; native in N. Amer., Eu. and Asia; adaptable to mild or warm regions. For cult. see *Conifers.* These are the true cypresses, to which Chamæcyparis is closely related. Except *C. Macnabiana,* the species can be grown satisfactorily only in the lower S. and Calif.

arizonica. Tree to 40 ft. and more: lvs. pale or glaucous-green, acute: cones to 1 in. across, glaucous. Ariz., New Mex., Mex.; much planted in the S. W. Var. **bonita** (*C. glabra*) has larger cones and is very glaucous when young. Var. **compacta** is a low roundish form. Var. **glauca** is a juvenile silvery-gray stage.

Benthami: *C. lusitanica* var.

californica: *C. Goveniana.*

cashmeriana. Tree with drooping branchlets: cones ½ in. across. Kashmir.

Duclouxiana. Tree: lvs. obtuse, somewhat glaucous: cones 1 in. across. China.

excelsa: *C. lusitanica* var. *Benthami.*

funebris. MOURNING C. Tree to 60 ft., with drooping branches and flattened branchlets: lvs. acute, light green: cones to ½ in. across. China.

glabra: *C. arizonica* var. *bonita.*

glauca: *C. lusitanica.*

Goveniana (*C. californica. C. pygmæa*). Shrub or rarely tree to 75 ft.: lvs. acute, dark green: cones to ¾ in. across. Calif.

guadalupensis. Tree to 40 ft. or more, the branchlets bright red: lvs. acute, light bluish-green: cones to 1¼ in. across. Guadeloupe Isl., Calif., and Lower Calif.

horizontalis: *C. sempervirens* var.

Knightiana: *C. lusitanica* var.

Lambertiana: *C. macrocarpa.*

Lawsoniana: *Chamæcyparis Lawsoniana.*

Lelandii. Hybrid between *C. macrocarpa* and *Chamæcyparis nootkatensis.*

Lindleyi: *C. lusitanica.*

lusitanica (*C. glauca. C. Lindleyi*). PORTUGUESE C. Tree to 50 ft. with somewhat drooping branchlets: lvs. acute, glaucous-green: cones ½ in. across, glaucous. Mex. Var. **Benthami** (*C. Benthami. C. excelsa*). Branchlets pinnately and regularly branched in one plane. Var. **Knightiana** (*C. Knightiana*) is more regularly branched.

Macnabiana. Shrub or tree to 20 ft.: lvs. obtuse, fragrant, dark green or glaucous: cones 1 in. across. Calif., Ore.; hardy in parts of New England. In var. **sulphurea** the tips of the branchlets are golden.

macrocarpa (*C. Lambertiana*). MONTEREY C. Tree to 40 ft. and more: lvs. obtuse, dark or bright green: cones to 1½ in. across. Calif. Var. **Crippsii** is a juvenile form with tips of branchlets silvery-white and spreading sharp-pointed lvs. Var. **fastigiata** has a compact fastigiate head. Var. **lutea** has yellow lvs. when young.

nootkatensis: *Chamæcyparis nootkatensis.*

obtusa: *Chamæcyparis obtusa.*

pisifera: *Chamæcyparis pisifera.*

pygmæa: *C. Goveniana.*

Roylei: *C. sempervirens* var. *indica.*

Sargentii (*C. Goveniana* var. *Sargentii*). Shrub or tree to 16 ft.: lvs. acute, dark green, fragrant: cones to 1 in. across. Calif.

sempervirens. ITALIAN C. Tree to 80 ft.: lvs. obtuse, dark green: cones to 1½ in. across. S. Eu., W. Asia. Var. **horizontalis** (*C. horizontalis*) has horizontally spreading branches. Var. **indica** (*C. Roylei*). Columnar form with globose cones. Var. **stricta** (var. *pyramidalis* and *fastigiata*) is of columnar habit.

thyoides: *Chamæcyparis thyoides.*

torulosa. BHUTAN C. Tree to 150 ft., with drooping branchlets: lvs. somewhat acute, bright or bluish-green: cones to ¾ in. across. Himalayas. Var. **Corneyana** has drooping branches.

CURCAS: *Jatropha Curcas.*

CURCULIGO. *Amaryllidaceæ.* Stemless plants with short thick rootstocks and long plicate lvs. which conceal the small fls. borne near the ground in dense heads or spikes.

Greenhouse foliage plants, or grown out-of-doors in the South for the attractive clumps. They require abundant moisture and high temperatures. A good greenhouse soil is one of 2 parts loam to 1 of sand and rotted cow-manure. Propagated by division.

capitulata (*C. recurvata*). Lvs. to 3 ft. long and 6 in. wide, recurving: fls. yellow, ¾ in. across, in heads on brown-hairy scapes which are bent downward at end. Trop. Asia, Australia.

latifolia. Lvs. to 2 ft. long and 5 in. wide, curving: fls. bright yellow, in heads on short erect scapes. Asia.

recurvata: *C. capitulata.*

CURCUMA. *Zingiberaceæ.* Robust per. herbs with tuberous roots, short leafy sts. and bracted fls. in dense spikes topped by a tuft of colored bracts, the lateral staminodia and also filament of fertile stamen petal-like.

Grown in a warm greenhouse in rich moist soil and rested during the winter, and planted in the open in warm countries; sometimes seen in collections of economic plants, as they yield dyes and curry products. Propagated by division of tubers in spring. See *Zingiberaceæ.*

longa. Lvs. to 1½ ft. long and 8 in. broad: fls. pale yellow, in spikes to 7 in. long tipped by pale pink bracts. India.—Root yields turmeric used as a condiment and dye.

petiolata. Lvs. to 10 in. long and 6 in. broad: fls. yellowish-white, in spikes to 6 in. long tipped by purple bracts. E. Asia.

Zedoaria. Lvs. to 2 ft. long and 6 in. broad, with very long sheaths: fls. yellow with whitish sepals and green bracts, in spikes to 4 in. long. India.

CURMERIA: *Homalomena Wallisii.*

CURRANT AND GOOSEBERRY. These fruits are so similar in cultural requirements that they may be considered together in this Hortus. They belong to the same genus, Ribes, according to former prevailing usage, but latterly the gooseberries have been segregated by some writers in the genus Grossularia. The red and white currants are *Ribes sativum*, the black currant *R. nigrum;* the gooseberries of American origin, such as Houghton, Downing, Pale Red, are forms of the native *Ribes hirtellum* (*Grossularia hirtella*) or hybrids from it; and the European gooseberries, which are much subject to mildew in this country, are *Ribes Grossularia* (or *Grossularia reclinata*).

Currant and gooseberry are fruits of exceptional hardiness, their culture extending nearly to the Arctic circle. They reach their best development in a cool somewhat humid climate and, therefore, are not well adapted to the warmer or drier parts of the United States. Cool moist clay loams or silt loams of high fertility are more satisfactory for these fruits than the lighter soil types; but the land must be well drained. Because they are among the hardiest and most productive of fruits and able to live even under neglect, the currant or gooseberry patch is often allowed to become foul with grass, never thinned or trimmed, the worms eating the leaves until, in the course of time, the plants yield only a small and indifferent product; yet no fruits respond more readily to good care and sufficient fertilizing.

Propagation of currants and some gooseberries is by means of stem-cuttings. Vigorous shoots of the season's growth are cut from the bushes late in autumn and either planted in the nursery row immediately or stored in moist sand and planted in the spring. Gooseberries are usually propagated by mound-layering. Soil is heaped about the bases of the stems, which send out roots. The rooted shoots thus formed are removed and set in the nursery row. To succeed best with this method, the plant should have been cut back to the ground so that all the shoots are but one season old.

Planting may be either in early spring or late autumn except in the colder climates where spring planting is advisable. Gooseberries and currants may be planted in hills 5 x 5 or 6 x 6 feet, or in rows 6–7 feet apart, plants 4 feet apart in the row.

Clean tillage followed by cover-crops late in the season are advisable for these fruits. A thick mulch of straw or coarse manure is very valuable especially in the home planting, provided that mice do not cause serious damage. Stable manure is the best fertilizer, but when it is not available a complete commercial fertilizer may be applied. The partial shade afforded by a young orchard suits the currant well, and if the ground is in good condition no bad results will follow to the orchard provided the currants are removed before the trees need the entire feeding space. A currant or gooseberry patch should continue in good bearing for ten to twenty years, if properly handled.

The red and white currants and the gooseberry bear mostly on two-year-old or older wood. A succession of young shoots should be allowed to grow to take the place of the old bearing wood. It is very important to keep the old weak canes cut out, and a succession of three to seven new ones coming from the root each year. This results in a low bush, very different from the tall awkward bushes with spurry parts that one sees in old yards. The black currant makes a large and stronger plant. It bears mostly on wood of the previous year, and therefore it is important to have new wood constantly coming on. After a few years in neglected plantations that make little new growth the yield becomes small and poor.

Both currants and gooseberries are picked by hand, commonly into quart berry-boxes. Ripe gooseberries for the table are little known in the United States. Green gooseberries, as they are seen on the market, are stripped from the vines with the hands protected with leather mittens; they are then cleaned in a fanning mill and marketed in quart baskets or taken to the cannery. Yields of 2 to 4 tons an acre of currants and gooseberries may be expected.

Following are some of the prominent varieties, the most popular kinds being starred (*): *Varieties of currants* — *Cherry, Diploma, *Fay, London, *Perfection, Wilder, *White Grape, White Imperial. *European gooseberries* — Chautauqua, *Industry, Runge, *May Duke. *American gooseberries* — Carrie, *Downing, Red Jacket, Oregon, *Poorman.

Pests and diseases should receive prompt attention. Both currants and gooseberries should have a dormant spray of lime-sulfur 1–15 for the control of scale and mildew. When the fruit is well set, bordeaux mixture, 4–4–50 with 1½ pounds arsenate of lead powder added may be applied to control mildew and currant-worms.

CURRANT, INDIAN: *Symphoricarpos orbiculatus.*

CURUBA: *Sicana odorifera.*

CUSH-CUSH: *Dioscorea trifida.*

CUSTARD-APPLE: *Annona reticulata.*

CUTTINGS: see *Propagation.*

CYANOPHYLLUM: *Miconia magnifica.*

CYANOTIS. *Commelinaceæ.* Per. herbs with creeping or weak sts., sheathing lvs., and blue or reddish fls. in scorpioid cymes or clusters; native in warm parts of Old World, and grown in greenhouses. Propagated by cuttings.

somaliensis. Flowering sts. to 9 in. long; lvs. narrow-triangular, 1½ in. long, hairy: fls. in dense heads not longer than lf.-sheaths. Trop. Afr.

CYATHEA. Tree-Fern. *Cyatheaceæ.* Tree-ferns with trunks 50 ft or more high: lvs. evergreen, very large, usually 2–3-pinnate; sori on back of segms., the indusium bursting and persistent as a fringe: tropics and subtropics. Propagated by spores. See *Ferns.*

dealbata. Trunk to 30 ft. high and 1½ ft. diam.: lvs. spreading horizontally, to 12 ft. long and 4 ft. broad, yellowish-green above and powdery-white beneath. New Zeal., Lord Howe Isls.—Frequently cult.

Dregei. Lvs. bipinnate, glabrous. Afr.

insignis. Lvs. very large, pinnæ to 8 ft. long and secondaries to 8 in. and pinnatifid, the ultimate lobes oblong-obtuse and ¼ in. long. Jamaica.

medullaris. Sago-Fern. Trunk to 50 ft. high and 2½ ft. diam.: lvs. curving, to 20 ft. long and 5 ft. broad, dark green above, paler green beneath. New Zeal.

CYATHEACEÆ. Tree-Fern Family. About 7 genera of ferns with distinct trunks or sts., native in warm regions on both sides of the world: lvs. pinnately compound, with sori on backs or margins: differs from Polypodiaceæ in technical characters of the sporangia. A few genera are grown under glass, as Alsophila, Cibotium, Cyathea, Dicksonia, and planted in protected places in the open in the warm parts of the country.

CYATHODES. *Epacridaceæ.* Shrubs from Australia to Pacific Isls., having imbricated or scattered lvs. and small fls. solitary in the axils; one planted in Calif.

acerosa. To 15 ft.: lvs. linear or lanceolate, to ⅔ in. long, stiff and pungent-pointed, margins recurved, glaucous beneath.

CYCADACEÆ. Cycads. Stiff evergreen plants of slow growth and mostly with an unbranched trunk at least when young, and stiff pinnate or bipinnate lvs. in a basal rosette or crown at top, and diœcious fls. of which the staminate are in thick cones and the pistillate usually in heads. The family is rich in fossil species. There are 9 trop. and subtrop. genera of which the following are known to hort.: Ceratozamia, Cycas, Dion, Encephalartos, Macrozamia, Microcycas, Zamia. In morphology cycads are considered to be nearest the fern-allies of any of the sporophytes or flowering-plants. The classification is with the gymnosperms. They are of slow growth and maturity, and are grown for their interest as well as for ornament. They are more or less palm-like. In Cycas the seeds are mostly 4 or more to each carpophyll whereas in the other genera they are 2. Virgin plants in cult. may be difficult to determine.

CYCAS. *Cycadaceæ.* About 16 species in the eastern hemisphere, two of them well known in cult. for the stiff glossy evergreen long foliage which is pinnately divided and more or less fern-like; pinnæ with strong midrib. The lvs. are often cut and used for house decoration. See *Cycadaceæ.*

Cycads are grown in greenhouses or as specimen plants out-of-doors in warm regions. They should be given abundant moisture and partial shade. Propagated by suckers which are taken when dormant and the leaves removed; also by seeds sown in shallow boxes or benches and covered with sand and potted off after germination. Slanting sections of the trunk 2–3 inches thick may be used for propagation; they should be dried a few days, then planted, and when new plants form they should be repotted separately.

circinalis. Trunk to 12 ft. high: lfts. to 1 ft. long, flat on edges: fr. about size of walnut. Old World tropics.

Micholitzii. Trunk subterranean: lvs. to 10 ft. long, pinnæ 8–10 in., plane, twice forked. Cochin-China.—Has been grown as *Pseudocycas Micholitzii.*

Normanbyana. Trunk to 10 ft. or more: lfts. to 8 in. long, flat on edges. Australia.

revoluta. Trunk to 10 ft. high: lfts. revolute or rolled on edges: fr. about 1½ in. long, somewhat flattened, red. Japan.—Sometimes called "sago-palm," but it is not a palm.

CYCLAMEN. *Primulaceæ.* Herbs with large hard tuberous roots, heart-shaped basal lvs., solitary nodding fls. borne on scapes, with purple, rose or white corolla-lobes strongly reflexed; native in the Medit. region and Cent. Eu., one a popular florists plant and a few others sometimes grown out-of-doors.

Cyclamens respond best in a soil composed of 2 parts leaf-mold, 1 part sand, and 1 part loam. They are very sensitive to moisture conditions and will not thrive if allowed to dry out or if water stands around the roots. A moist atmosphere is beneficial. Red-spider may be eliminated by syringing the leaves on both sides several times a week.

Tubers large enough to flower the first year may be purchased from seedsmen. Seeds may be sown in September, wintered in a cool house, repotted in May, and in July transferred into 5- or 6-inch pots in a shaded frame. Before frost they should be taken indoors and grown in a cool house through the flowering period.

coum. Fls. purple with spotted throat, the corolla-lobes ovate, small, odorless, in autumn. S. Eu. to Persia.

europæum. Fls. bright red, the corolla-lobes oblong or ovate, very fragrant, on scapes 4–5 in. high, blooming in summer and autumn. Cent. and S. Eu.

hederæfolium: *C. indicum.*

ibericum. Lvs. sometimes marked with white above: fls. purple with darker throat, the corolla-lobes ovate. Caucasus.

indicum (*C. persicum. C. hederæfolium. C. macrophyllum*). Florists C. Lvs. usually variegated with white: fls. large, odorless, white or in shades of purple and rose, dark purple at the mouth, the corolla-lobes oblong-lanceolate, on scapes 6–8 in. high. Greece to Syria. Var. giganteum has larger fls. and many named forms are in the trade.

macrophyllum: *C. indicum.*

neapolitanum. Fls. red or white, appearing mostly before the lvs. in summer or autumn, the corolla-lobes ovate and eared at the base. Cent. and S. Eu.

persicum: *C. indicum.*

repandum. Fls. purple with darker throat, the corolla-lobes oblong or linear-oblong. Medit. region.

CYCLANTHACEÆ. Cyclanthus Family. Six trop. American genera comprise the family: more or less herbaceous palm-like plants, acaulescent or nearly so, with long-stalked lvs., unisexual fls. in dense spadices subtended by bract-like spathes resembling an aroid infl., and fr. composed of cohering carpels. Carludovica and Cyclanthus are grown in greenhouses in cold countries; the genera differ in technical botanical characters.

CYCLANTHERA. *Cucurbitaceæ.* Herbaceous vines, ann. or per., above 30 species in the warm parts of Amer. and extending north as far as Kans., two of which are sometimes grown for ornament and as screens, both ann. or grown as such: monœcious: lvs. lobed or compound: fls. very small, yellow, white or greenish, the pistillate solitary in axils and staminate racemose or paniculate: fr. small, scarcely fleshy, mostly spiny or setose. Grown from seeds, as for gourds.

explodens. To 10 ft. or so, nearly glabrous: lvs. ovate-triangular to broad-oblong, 2–3 in. long, 3-angled or -lobed: fr. 1 in. or more long, usually curved, stout-spiny on one side, bursting forcibly. N. S. Amer.

pedata. Glabrous, to 10 ft. and more: lvs. with 5–7 narrow crenate-dentate lfts.: fr. about 2 in. long, oblong, with scattering prickles. Mex. south.

CYCLANTHUS. *Cyclanthaceæ.* Stemless milky-juiced herbs resembling palms, the fls. fragrant; 4 species in trop. Amer. Cult. as for *Carludovica.*

bipartitus. Lvs. entire or 2-lobed to base, the stalks to 6 ft. long: spathes of 4 yellow lvs. Guiana.

CYCLOBOTHRA: *Calochortus flavus.*

CYCLOPHORUS. FELT-FERN. *Polypodiaceæ.* Asian and Malayan ferns with usually simple and entire lvs. tomentose on back, leathery; sori naked, covering back of lvs.; much like Polypodium and often so listed; for cult. see *Ferns.*

Lingua (*Niphobolus Lingua. Polypodium Lingua*). TONGUE-FERN. JAPANESE F. Lvs., including stipes, to 15 in. long, entire, lanceolate or ovate-lanceolate, rusty beneath. China, Japan and south. Var. **corymbiferus,** CRESTED F., has lvs. forked at the apex. Var. variegatus is variegated.

CYCNOCHES. SWAN ORCHID. *Orchidaceæ.* Trop. American epiphytes having pseudobulbs, plaited lvs. and fls. of 2 sexes, sometimes similar with narrow sepals and petals and entire lip, or often quite different, the male fls. with lip clawed and with fingerlike projections; grown in the warm greenhouse. See *Orchids.*

chlorochilon. Lvs. elliptic, to 16 in. long: fls. similar, about 6 in. across, yellow-green with darker spot at base of lip, May–June. Venezuela, Colombia.

CYDISTA. *Bignoniaceæ.* One woody climber native from W. Indies to Brazil and grown in subtrop. regions. **C. æquinoctialis** (*Bignonia æquinoctialis*). Lvs. of 2 ovate leathery wavy-margined lfts. to 6 in. long, and often a terminal tendril: fls. showy, white or purplish, to 3 in. long, funnelform with rounded lobes, in racemes: fr. linear, to 1 ft. long.

CYDONIA. QUINCE. *Rosaceæ.* One deciduous small much branching tree from Persia and Turkestan grown for its edible fr. For cult. see *Quince.* **C. oblonga** (*C. vulgaris. Pyrus Cydonia*). To 20 ft.: lvs. ovate to oblong, to 4 in. long, densely tomentose beneath: fls. white or pale pink, to 2 in. across, solitary at the end of leafy shoots of the season: fr. a pear-shaped or apple-shaped tomentose pome to 3 in. or more across, fragrant. For other names listed as Cydonia see *Chænomeles,* the Japanese or Flowering quince.

CYMBALARIA. *Scrophulariaceæ.* Creeping herbaceous perennials, native in the Old World, often united with Linaria but differing in the fls. axillary and solitary and the lvs. palmately veined; a few are grown as groundcover in the greenhouse or in the open, or in vases and hanging-baskets.

These plants are tender in the North but seed themselves freely; they thrive in moist and partially shaded positions, as in greenhouses and about yards. Propagated by division of the long stems, and by seeds.

æquitriloba (*Linaria æquitriloba*). Lvs. mostly opposite, entire or slightly 3–5-lobed: fls. pale mauve with reddish-purple throat. S. Eu.

hepaticæfolia (*Linaria hepaticæfolia*). Lvs. mostly opposite, with 3–5 short or indistinct lobes: fls. lilac-blue with yellowish throat, about ½ in. long: caps. shorter than sepals. Corsica.

muralis (*Linaria Cymbalaria*). KENILWORTH IVY. Sts. trailing and rooting at the nodes: lvs. mostly alternate, irregularly 3–7-lobed: fls. lilac-blue, throat yellowish, ⅓ in. long: caps. longer than sepals. Eu., nat. from Ont. to Pa.—Common about greenhouses. Var. **alba,** fls. white; **maxima** (*Linaria pallida*), fls. large; **rosea,** fls. pale pink.

pilosa (*Linaria pilosa*). Pubescent: lvs. opposite and alternate, 3–11-lobed: fls. lavender with yellow throat: caps. longer than sepals. Italy.

CYMBIDIUM. *Orchidaceæ.* Mostly epiphytes with or without pseudobulbs and fls. in racemes, the sepals and petals similar, the lip entire or 3-lobed and with 2 keels; cult. in greenhouse mostly with intermediate and often with cool temperature; sometimes planted out. See *Orchids.*

Alexanderi. Hybrid between *C. Veitchii* and *C. insigne.*

aloifolium. Lvs. linear, to 1½ ft. long: fls. in many-fld. pendulous racemes to 20 in. long; sepals and petals brownish-yellow; lip 3-lobed, brownish-red with bright yellow center and side lobes, edged with white, July–Aug. Ceylon, Indo-China.

Cooperi. Hybrid between *C. insigne* and *C. Schrœderi.*

eburneo-Lowianum: *C. Veitchii.*

eburneum. Lvs. to 2 ft. long and ½ in. wide: fls. 4 in. across, in 1–2-fld. racemes to 1 ft. long, fragrant, snow-white, the lip with yellow center and 3–5 hairy keels, Apr.–May. Himalayas.

ensifolium. Lvs. linear, to 1 ft. long: fls. in 3–7-fld. racemes to 1 ft. long, greenish-yellow sometimes veined with red, the lip with 2 white keels, May. China, Japan.

Finlaysonianum. Lvs. to 2 ft. long and 2 in. wide: fls. in many-fld. racemes to 2½ ft. long; sepals and petals brownish-yellow; lip 3-lobed, spotted and marked with red and with 2 white keels, May–June. Malaya. Var. **atropurpureum** has purplish sepals and petals.

giganteum. Lvs. linear, to 2 ft. long: fls. 4 in. across, fragrant, in 7–12-fld. arching racemes longer than lvs.; sepals and petals green- or brownish-yellow lined with dark brown; lip 3-lobed, yellow marked with brown, the middle lobe wavy-margined, Sept.–Oct. Himalayas.

Gottianum. Hybrid between *C. eburneum* and *C. insigne.*

grandiflorum. Lvs. to 2 ft. long: fls. to 6 in. across; sepals and petals olive-green; lip 3-lobed, bright yellow dotted with purple-brown, Nov. Himalayas.

Hamburyanum. Hybrid between *C. erythrostylum* and *C. Traceyanum.*

Holfordianum. Hybrid between *C. eburneum* and *C. grandiflorum.*

insigne. Lvs. to 3 ft. long and 1 in. wide: fls. 3½ in. across, in 10–15-fld. racemes to 5 ft. high; sepals and petals rose; lip 3-lobed, rose spotted with purple-red and with 2 yellow scales, Mar.–May. Cochin-China.

Lowianum. Lvs. linear, to 2½ ft. long: fls. about 4 in. across, in 10–20-fld. arching racemes; sepals and petals greenish-yellow; lip 3-lobed, yellow with scarlet midlobe, Feb.–July. Burma. Var. **concolor** lacks the scarlet.

Mastersii. Lvs. linear, to 2 ft. long: fls. in 4–8-fld. racemes to 1 ft. high; sepals and petals white tinged with brownish-rose; lip 3-lobed, white with yellow ridges, Nov.–Dec. Himalayas.

Pauwelsi. Hybrid between *C. Lowianum* var. *concolor* and *C. insigne.*

Schlegeli. Hybrid between *C. insigne* and *C. Wiganianum.*

Schroederi. Sepals and petals green marked with reddish-brown; lip bright yellow striped with brown. Cochin-China.

tigrinum. Lvs. to 4 in. long and ¾ in. wide: fls. in 4–6-fld. racemes to 8 in. high; sepals and petals olive-green; lip 3-lobed, white, the side lobes marked with red and midlobe spotted with red, May–June. Burma.

Traceyanum. Very similar to *C. giganteum* but with fls. to 6 in. across and darker colored, Oct.–Nov. Burma.

Veitchii. Hybrid between *C. eburneum* and *C. Lowianum.*

Wiganianum. Hybrid between *C. eburneum* and *C. Traceyanum.*

Winnianum. Hybrid between *C. giganteum* and *C. Mastersii.*

Woodhamsianum. Hybrid between *C. Lowianum* and *C. Veitchii.*

CYMBOPOGON. *Gramineæ.* Mostly per. grasses of tropics of Old World grown for the oil from herbage and roots and sometimes for ornament, differing from Andropogon in technical characters; aromatic. See *Grasses.*

citratus. Lemon-Grass. Differs from *C. Nardus* in the sterile spikelets linear rather than lanceolate. Known only in cult.

Nardus. Citronella-Grass. Per. to 6 ft.: lvs. fragrant, to 3 ft. long and ¾ in. wide, glaucous: infl. to 2½ ft. long. Trop. Asia; nat. in trop. Amer.

Schœnanthus. Camel-Hay. Per. to 2 ft.: differs from *C. Nardus* in the joints of the raceme hairy and concealing the spikelets. N. Afr., S. Asia.

CYME: a broad more or less flat-topped determinate flower-cluster; with central flowers opening first.

CYMOPHYLLUS: *Carex Fraseri.*

CYNANCHUM. *Asclepiadaceæ.* Per. herbs, often shrubby and twining, with opposite lvs., wheel- or bell-shaped fls. in clusters, and milkweed-like frs.; native in Eu., Asia and Afr. Propagated in spring by division of roots. Grown in any good garden soil.

acuminatifolium (*Vincetoxicum acuminatum. V. japonicum*). Mosquito-Trap. Erect, the tips of the sts. perhaps with a viney habit: lvs. arrow-shaped, gray-pubescent beneath: fls. white, in summer. Japan. Var. **violaceum** is a dwarfer form.

erectum: *Marsdenia erecta.*

CYNARA. *Compositæ.* Coarse herbaceous thistle-like per. or bien. herbs with large lobed or pinnately cut lvs. and large terminal heads of violet, blue or white disk-fls.; pappus plumose; native in Medit. region and Canary Isls.

Two species are grown as garden vegetables. They need rich soil and abundant moisture. The cardoon is blanched in much the same way as celery or endive. It is increased by seeds and by suckers. The artichoke is propagated also by division in early spring. Seeds give more variable results; if sown early enough edible heads may be obtained the same year, but usually not until the second year.

Cardunculus. Cardoon. To 6 ft. or more, cult. for its edible root and thickened lf.-stalks: lvs. grayish-green above, white-tomentose beneath, spiny: heads purple, the bracts of involucre spine-tipped. S. Eu

Scolymus. Artichoke. To 5 ft.: lvs. white-tomentose beneath, scarcely spiny: heads purple, the receptacle enlarged and fleshy and edible as are the thickened bases of the unarmed involucral bracts. Probably derivative of *C. Cardunculus.*

CYNODON (*Capriola*). *Gramineæ.* Per. grasses, creeping and stoloniferous, and valuable for pastures and lawns in warm regions: lvs. short: spikelets one-sided, in slender spikes borne in digitate clusters at ends of sts.: native in Eu., Asia and Australia but now widely spread and nat. See *Grasses.*

Dactylon. Bermuda-Grass. To 1 ft.: lvs. to 2 in. long and ⅙ in. wide, rough above: spikes to 2 in. long, spreading, in clusters of 3–5.—Much used for lawns in southern states.

CYNOGLOSSUM. Hounds-Tongue. *Boraginaceæ.* Rather weedy mostly stiff-hairy herbs, ann., bien. and per., mostly in the temp. zones, with alternate simple lvs. and blue, purple or white small fls. in terminal one-sided racemes: fr. a bur or "stick-tight": sometimes grown in the flower-garden. Propagated by seeds.

amabile. Bien. to 2 ft.: lvs. lanceolate-oblong: fls. blue, ¼ in. long. E. Asia.

cœlestinum: *Adelocaryum cœlestinum.*

furcatum: *C. zeylanicum.*

glochidiatum: *C. Wallichii.*

grande. Per. to 3 ft.: lvs. mostly basal, ovate or oval: fls. blue or purple with white center, ½ in. long. Wash, to Calif.

linifolium: *Omphalodes linifolia.*

nervosum. To 3 ft.: lvs. lanceolate or oblong: fls. blue, ⅔ in. across. Himalayas.

nobile: *Myosotidium hortensia.*

Wallichii (*C. glochidiatum*) Ann. to 2 ft.: lvs. oblong or lanceolate: fls. blue, ⅛ in. long. Asia.

zeylanicum (*C. furcatum*). To 3 ft.: lvs. oblong, silky-hairy: fls. blue, ⅛ in. long. India.

CYNOSURUS. *Gramineæ.* Old World ann. and per. tufted grasses with flat lvs. and spikelets in clusters forming a dense spike-like infl.; one species sometimes grown in pastures. See *Grasses.*

cristatus. Crested Dogs-Tail. Per. to 2½ ft.: lvs. to 5 in. long and ⅙ in. wide: spikes to 4 in. long, appearing crested because of the ciliate lemmas. Eu.; escaped in E. N. Amer.

CYNOXYLON: *Cornus florida.*

CYPELLA. *Iridaceæ.* Bulbous herbs with both basal and st.-lvs. and yellow, orange or blue fls. in clusters, the perianth-segms. free; native of S. Amer. Differs from Iris and Moræa in characters of stigma and anthers.

These bulbs may be grown in the greenhouse or set out in spring and stored indoors over winter. Propagated by offsets or seed.

Herberti. To 3 ft.: lvs. linear, 1 ft. long, plaited: fls. yellow, 3 in. across. Brazil, Uruguay, Argentina.

CYPERACEÆ. Sedge Family. Grass-like herbs with slender solid usually 3-angled sts., lvs. with closed sheaths, small green fls. borne in spikes, perianth when present represented by bristles or scales, 2–3 stamens, 1-celled ovary, and fr. an achene. Fls. not showy, but many of the plants are attractive in form and habit. The family comprises about 75 genera, many of them inhabiting swamps and low places. Only a few are cult., as Carex, Cyperus, Eriophorum, Scirpus.

CYPERUS. Galingale. *Cyperaceæ.* Ann. and per. herbs with grass-like lvs. and bisexual fls. borne in spikelets which are assembled in heads or racemes and these in turn often in large terminal umbels; about 600 species of wide distribution.

Grown in ponds, as pot-plants and the chufa for its edible tubers. Propagated by division or by seeds sown in spring or early fall. In *C. alternifolius* the crown of leaves may be cut off and set in sand or moss, and new plants will form from the leaf-axils. The species in cultivation are perennial.

adenophorus. Sts. to 2 ft., leafy below: spikelets stalked, on secondary or tertiary rays in the umbel. Brazil.

alternifolius. Umbrella Plant. Sts. to 4 ft., lvs. reduced to sheaths: spikelets sessile, on primary rays to 5 in. long, the umbels subtended by long lvs. giving an umbrella-like effect. Afr.; nat. in trop. Amer.—Requires much moisture at the root. Var. **gracilis** is a smaller plant with shorter involucral lvs. Var. **variegatus** has lvs. and sts. lined with white.

esculentus. Chufa. Earth-Almond. To 3 ft.: spikelets sessile, the large umbels subtended by long broad involucral lvs. N. Amer., Eu., Asia.—Propagated in spring by planting the little tubers or chufas; the tubers are eaten when dry and are food for chickens and pigs.

natalensis. Sts. to 2 ft., often nearly leafless: spikelets on rays to 7 in. long, the involucral lvs. short. Natal.

Papyrus (*Papyrus antiquorum*). Papyrus. Sts. to 8 ft., lvs. reduced to sheaths: spikelets sessile, with many drooping thread-like rays to 1½ ft. long which are longer than the involucral lvs. S. Eu., Syria, Afr.—This is the paper plant of the Egyptians; a stately plant for ponds, growing in shallow water.

virens. Sts. to 3 ft., with long lvs. to ½ in. wide: spikelets sessile, the rays from ½–8 in. long. S. U. S. to S. Amer.

CYPHOMANDRA. *Solanaceæ.* Herbs, shrubs or small trees with large entire 3-lobed or pinnately cut lvs., wheel- or bell-shaped fls. in racemes or cymes, and fr. a 2-celled many-seeded berry; native in S. Amer.

One species is grown for its edible fruit in the open in subtropical parts and occasionally in conservatories in the North. Propagated by seeds sown under glass and the plants treated as eggplants; also by cuttings of growing shoots.

betacea. Tree-Tomato. Somewhat woody tree-like shrub to 10 ft., mostly soft-hairy: lvs. cordate-ovate, to 1 ft. long: fls. pinkish, ½ in. across, fragrant: fr. egg-shaped, dull red, to 3 in. long, smooth, with slightly acid tomato-like flavor. S. Amer.

CYPRESS: *Cupressus, Taxodium.* **False-:** *Chamæcyparis.* **Standing-:** *Gilia rubra.* **Summer-:** *Kochia scoparia.* **-Vine:** *Quamoclit pennata.*

CYPRIPEDIUM. Lady-Slipper. Moccasin-Flower. *Orchidaceæ.* Terrestrial orchids native in the north temp. zone, with broad lvs., fls. solitary or in few-fld. terminal racemes, with an inflated sac-like lip; grown in rock-gardens or moist borders. The greenhouse cypripediums belong to other genera, as *Cordula* and *Paphiopedilum*, which see. For cult. see *Orchids*.

acaule (*Fissipes acaulis*). To 10 in. high, having 2 basal lvs. to 8 in. long and 3 in. wide: fls. solitary, to 5 in. across, sepals and petals greenish; lip rose veined with darker color, May–June. Newf. to N. C. and Minn.

californicum. To 2½ ft., with leafy sts.: lvs. to 4 in. long, ovate-lanceolate: fls. to 1½ in. across, in 6–12-fld. racemes, with brownish sepals and petals and white or rose lip spotted with brown, May. Ore., Calif.

fasciculatum. To 1 ft.: lvs. 2 to a st., to 4 in. long and 2½ in. wide: fls. about 1 in. across, in 4–6-fld. racemes; sepals and petals greenish veined with brown; lip greenish-yellow veined with brown, May–June. Calif. to Wash.

japonicum. To 16 in.: lvs. 2 to a st., to 5 in. long: fls. solitary, about 2½ in. across; sepals greenish spotted with red at base; petals white spotted at base with red-brown; lip white or rose spotted with red, May–June. Japan, China.

macranthum. To 16 in., the sts. with 3–4 lvs.: fls. solitary; sepals and petals purple; lip dark red, May–June. Siberia.

montanum. To 16 in., sts. leafy: lvs. to 6 in. long and 3 in. wide: fls. 4 in. across, in 1–3-fld. racemes; sepals and petals brown; lip white veined with purple, May–June. W. N. Amer.

parviflorum. To 16 in., sts. leafy: lvs. to 6 in. long, oval or elliptic: fls. 1–2 together; sepals and petals brown, the latter twisted; lip yellow veined with purple, May–June. N. Amer. Var. **pubescens** (*C. pubescens*) has white-hairy lvs.

pubescens: *C. parviflorum* var.

Reginæ (*C. spectabile*). To 2 ft., sts. leafy: lvs. to 7 in. long and 4 in. wide: fls. 3 in. across, 1–2 together; sepals and petals white; lip striped rose and white, May–June. E. N. Amer.

spectabile: *C. Reginæ.*

CYRILLA. *Cyrillaceæ.* One shrub or tree to 30 ft., native from Va. to W. Indies and S. Amer. and planted for ornament in the S. Propagated by seeds and cuttings under glass. **C. racemiflora.** Leatherwood. Deciduous or more or less evergreen: lvs. oblong, to 3 in. long, shining above: fls. small, white, in narrow axillary racemes to 6 in. long, June–July.

CYRILLACEÆ. Cyrilla Family. Three American genera of shrubs and trees bearing alternate entire lvs. and small bisexual fls. with 5 sepals and petals, 5 or 10 stamens, superior 2–4-celled ovary, and angled or winged frs. Apparently only Cyrilla is planted outside botanic gardens, although *Cliftonia monophylla* is to be expected.

CYRTOMIUM. *Polypodiaceæ.* Half hardy or greenhouse ferns with simply pinnate lvs.; sori large, scattered; native in Asia, Afr., Pacific Isls.; differs from Polystichum in venation. They are known with us mostly as glasshouse ferns of simple cult. See *Ferns*.

Butterfieldii: a form of *C. falcatum* with cut segms.

caryotideum (*Aspidium falcatum* var. *caryotideum*). Differs from *C. falcatum* in the drooping habit and larger toothed segms. Japan, India.

falcatum (*Aspidium falcatum. Polystichum falcatum*). Holly-Fern. Stiff, erect: lvs. dark green, glossy, to 2½ ft. long and 8 in. wide, segms. to 4 in. long, ovate, edges entire or slightly wavy. Asia, S. Afr., Polynesia; frequent in conservatories. Var. **compactum** is dwarf.

Fortunei (*Aspidium falcatum* var. *Fortunei*). Similar to *C. falcatum* but lvs. dull and with smaller lanceolate segms. Japan.

Rochefordianum: a form of *C. falcatum* with deeply cut segms.

CYRTOPODIUM. *Orchidaceæ.* Epiphytic or terrestrial orchids with long plaited lvs. and fls. in racemes or panicles, the sepals and petals nearly equal, the lip 3-lobed. For cult. see *Orchids*.

punctatum. Epiphyte, with pseudobulbs to 3 ft. long: lvs. to 2 ft. long and 2 in. wide: sepals and petals yellow spotted with red; lip yellow edged with red, with long claw, Apr.–June. Trop. Amer.

CYRTOSTACHYS. *Palmaceæ.* Cespitose unarmed monœcious ringed feather-palms mostly with showy red petioles, sometimes grown under glass and to be expected in S. Fla.; species about 5, Malaya and Pacific Isls.: spadices below the lvs., or with the lower ones, paniculately branched, the stout branches 1–2 ft. long; fls. in 3's, the 2 staminate at the sides; stamens 6–12–15: fr. small and ovoid or long-ovoid. Attractive as young specimens, making good clumps. See *Palm.*

Lakka. Trunks to 15 ft., slender, smooth: lvs. 4–5 ft. long, grayish or glaucescent underneath; pinnæ about 50, to 1½ ft. or more long, 1½ in. or less broad, gradually long-pointed, with strong midrib and secondary veins prominent; petiole and rachis red: drupe narrowly ovate-conic, attenuate, about ⅖ in. long, black with scarlet base; seed ovoid. Borneo.

Renda. To 30 ft.: fr. ovoid or scarcely elongate, ⅖ in. long; seed round; otherwise much like *C. Lakka.* Var. **Duvivierianum** has bright red rather than dark brownish-red petiole and rachis. Sumatra.

CYSTOPTERIS (*Filix*). BLADDER-FERN. *Polypodiaceæ.* Rock-ferns with delicate foliage useful for rockeries and damp rocky protected banks: lvs. 2–4-pinnate; sori on back on veins, the indusia disappearing with age: native of the north temp. zone. See *Ferns.*

bulbifera. BERRY B. BULBLET B. Lvs. to 2½ ft. long and 5 in. wide, dark green, 2–3-pinnate, long tapering, segms. deeply incised, bearing bulb-like bodies on under surface from which new plants may be propagated. Newf. to Ga. and Ark.

fragilis. BRITTLE-FERN. Lvs. gray-green, to 10 in. long, short-pointed, 2–3-pinnate, segms. deeply cut. Widely distributed and variable; Greenland to Ga. and Ala. and westward, and elsewhere.

CYTHEREA: *Calypso.*

CYTISUS. BROOM. *Leguminosæ.* Shrubs with simple or trifoliolate deciduous or persistent lvs., sometimes the branches almost leafless, papilionaceous mostly yellow but sometimes purple and white fls. usually in terminal racemes, and flattened pods; grown out-of-doors where hardy and some forced in the greenhouse for early spring bloom; many of them are very showy.

Brooms succeed in sunny positions in soil not too rich. In the greenhouse they should be kept cool until ready for forcing in January. Propagated by seeds, greenwood cuttings under glass, layers or grafting.

albus (*C. leucanthus. C. schipkaensis*). To 1 ft.: lfts. to ¾ in. long: fls. yellowish-white to white, in terminal heads, in summer. S. E. Eu.

alpinus: *Laburnum alpinum.*

Andreanus: *C. scoparius* var.

Ardoinii. Procumbent, to 1½ ft.: lfts. to ⅓ in. long: fls. golden-yellow, axillary along branches, Apr.–May. S. France.

Attleyanus: *C. canariensis* var. *ramosissimus.*

austriacus. To 3 ft.: lfts. to 1 in. long: fls. bright yellow, in terminal heads, July–Aug. S. E. Eu.

Beanii. Hybrid between *C. Ardoinii* and *C. purgans,* partly prostrate.

canariensis (*Genista canariensis*). GENISTA of florists. Evergreen, much branched, to 6 ft.: lfts. to ½ in. long: fls. bright yellow, fragrant, in terminal short racemes, spring and summer. Canary Isls. Var. **ramosissimus** (*C. ramosissimus, C. Attleyanus*) has very small lfts.—Common under glass.

capitatus: *C. supinus.*

Dallimorei. Hybrid between *C. multiflorus* and *C. scoparius* var. *Andreanus:* fls. yellow, tinted with pink, wings crimson.

dalmaticus: *Genista silvestris* var. *pungens.*

decumbens (*Genista prostrata*). Prostrate, to 8 in.: lfts. to ¾ in. long: fls. yellow, axillary along branches, May–June. S. Eu.

elongatus. To 5 ft.: lfts. to 1 in. long: fls. yellow marked with reddish-brown, axillary. Cent. and S. E. Eu.

filipes (*C. palmensis*). Branches thread-like: fls. white, fragrant, axillary along the branches, in spring. Teneriffe.

fragrans (*Genista fragrans. Spartocytisus nubigenus*). Lfts. densely pubescent: fls. white, fragrant, axillary, in spring. Teneriffe.

hirsutus (*C. leucotrichus*). To 2 ft.: lfts. to ¾ in. long: fls. yellow, axillary, May–June. S. E. Eu.

kewensis. Hybrid between *C. Ardoinii* and *C. multiflorus:* procumbent, to 1 ft. high: lvs. sometimes simple but usually of 3 linear-oblong soft-pubescent lfts.: fls. yellowish-white, ½ in. long, on slender branches.

Laburnum: *Laburnum anagyroides.*

leucanthus: *C. albus.*

leucotrichus: *C. hirsutus.*

linifolius. To 3 ft.: lfts. to 1 in. long, silvery-pubescent beneath: fls. bright yellow, in racemes, in spring. Spain, N. Afr., Canary Isls.

maderensis. Evergreen, to 20 ft.: lfts. to ¾ in. long: fls. bright yellow, slightly fragrant, in terminal and lateral racemes, spring. Madeira. Var. **magnifoliosus** (*C. stenopetalus*) has larger lvs. and racemes.

monspessulanus. Evergreen, to 10 ft.: lfts. to ¾ in. long: fls. bright yellow, fragrant, in short racemes at the tips of lateral branchlets, in spring. S. Eu.

multiflorus (*Spartium multiflorum*). To 3 ft.: lfts. to ½ in. long: fls. white, axillary, in spring. Spain, N. Afr. Var. **incarnatus** has fls. slightly blushed.

nigricans. To 4 ft.: lfts. to 1 in. long: fls. yellow, in long slender terminal racemes, July–Aug. Cent. and S. E. Eu. Var. **elongatus** (var. *longespicatus*) blooms again in fall.

palmensis: *C. filipes.*

pilosa: *Genista pilosa.*

præcox. Hybrid between *C. multiflorus* and *C purgans:* to 10 ft.: lfts. to ¾ in. long: fls. light yellow, numerous along the branches, in May.

proliferus. To 12 ft.: lfts. to 1¾ in. long: fls. white, axillary, spring and early summer. Canary Isls.

purgans. To 3 ft., much branched: lvs. simple, to ½ in. long: fls. yellow, fragrant, axillary, May–July. S. Eu., N. Afr.

purpureus. To 2 ft., procumbent: lfts. to 1 in. long: fls. purple, white or pink in some forms, axillary along the branches, in May. S. Austria. Var. **elongatus** (var. *pendulus*), branchlets long and slender. Var. **erecta**, upright habit.

racemosus (*Genista racemosa*). Evergreen, to 6 ft.: lfts. to ¾ in. long: fls. yellow, in long racemes, late spring. Probably hybrid.

radiatus: *Genista radiata.*

ramosissimus: *C. canariensis* var.

sagittalis: *Genista sagittalis.*

schipkaensis: *C. albus.*

scoparius (*Genista scoparia. Spartium scoparium*). SCOTCH B. To 10 ft.: lfts. to ½ in. long: fls. yellow, solitary or in pairs in the axils, spring and summer. Eu.; nat. in N. Amer. Var. **Andreanus** (*Genista Andreana*) has yellow fls. with dark crimson wings.

sessilifolius. To 6 ft.: lfts. to ¾ in. long: fls. bright yellow, in short racemes at tip of lateral branchlets, in June. S. Eu., N. Afr.

stenopetalus: *C. maderensis* var. *magnifoliosus.*

supinus (*C. capitatus*). To 3 ft., sometimes procumbent: lfts. to 1 in. long: fls. yellow fading brownish, in terminal heads, in summer. Eu.

triflorus. To 8 ft., much branched: fls. yellow, 1–3 in the axils, nodding, in spring. S. Eu.

Watereri: *Laburnum Watereri.*

D

DABOËCIA. *Ericaceæ.* One evergreen heath-like little shrub suitable for rock-gardens but requiring winter protection in the N. Does best in a peaty soil. Propagated by seeds and by cuttings of half-ripened wood under glass. **D. cantabrica** (*D.* and *Menziesia polifolia*). IRISH-HEATH. To 2 ft.: lvs. elliptic, to ½ in. long, shining above, white-tomentose beneath: fls. purple, ½ in. long, nodding, in terminal racemes from June–Oct. W. Eu. In var. **alba** the fls. are white, **atropurpurea** deep purple, **bicolor** striped with white and purple. Var. **nana** is dwarf with smaller lvs.

DACRYDIUM. *Taxaceæ.* Evergreen trees or shrubs with scale-like lvs. or linear on young specimens, diœcious fls., and nut-like seeds surrounded by an aril; about 16 species in the southern hemisphere; grown in Calif. For cult. see *Conifers.*

cupressinum. RIMU. Tree to 100 ft., with long graceful drooping branches when young: lvs. ¼ in. and less long and decurrent in young state, about ⅛ in. long on mature parts: nutlet about ⅛ in. long, in an aril. New Zeal.

Franklinii. HUON-PINE. Tree to 100 ft., with short horizontal branches and drooping branchlets: lvs. scale-like and imbricated, about $^1/_{24}$ in. long: cones very small, with 4–8 scales. Tasmania.

DACTYLIS. *Gramineæ.* Tall per. grasses with flat lvs. and spikelets in dense clusters borne in open branched panicles; native of Eu. and Asia and one grown as hay, forage and pasture grass. See *Grasses.*

glomerata. ORCHARD-GRASS. COCKS-FOOT. To 4 ft., tufted: lvs. to 9 in. long and ¼ in. wide: panicles to 8 in. long. Widely nat. in N. Amer. Var. **variegata** has lvs. striped with silver and may be grown for ornament.

DÆDALACANTHUS: *Eranthemum.*

DÆMONOROPS. *Palmaceæ.* About 80 climbing (one of ours erect) polygamo-diœcious tufted feather-palms, mostly trop. Asia and beyond, differing from Calamus in the fact that the spiny outer spathes are boat-shaped and deciduous and at first inclosing the inner, and the fls. often or usually more pedicillate. Tried in S. Fla., but too tender; they climb by sharp recurved hooks at intervals on the rachis and its prolongation beyond the pinnæ; fr. scaly. For cult. see *Palm.*

fissus. Lvs. not tendril-bearing or prolonged into whip-like part; segms. or pinnæ 8, nearly opposite, 10–14 in. long and 1½–3 in. broad, spinulose toward apex and on ribs, acuminate; petiole 3 ft. or more long, armed as is the rachis: fr. size of small cherry, in dense clusters. Borneo.

Jenkinsianus. Pinnæ many, 1–2 ft. long, with 2 strong side ribs and all three bearing long more or less appressed bristles and the margins also setulose; petioles very spiny: fr. globose, ⅔ in. diam., brown. India.

palembanicus. Erect: lvs. cinnamon-brown when young and attractive; pinnæ many, narrow, to 1½ ft. long; petioles spiny on back. Sumatra.

DAFFODIL: *Narcissus.*

DAHLIA (*Georgina*). *Compositæ.* Strong tender per. herbs, sometimes tall and tree-like in form, much branched, with large underground tubers, from mts. of Mex. and Guatemala, popular for the showy heads in red, purple, yellow and white, characteristic ornamentals of autumn and late summer: lvs. pinnate to 3-pinnate, differing on the same plant: rays large and showy, pistillate or neutral, now developed into narrow, rolled and quilled forms; heads often full double, compact and ball-like.

Dahlias require a full season's growth, and if the soil is very rich they may not give much bloom before frost in northern regions; rather open "quick" soil, as a light loam suitable for corn or general garden purposes, produces good results, and any fertilizer that may be employed in the year of cultivation should be quickly available. Water must be supplied freely.

The customary propagation by the home gardener is by planting separately each tuber in the cluster. Care must be taken not to injure the crown. Only one stalk or trunk should be allowed, after danger from cutworms and early accidents is past. The cluster of tubers is carefully lifted in autumn as soon as the bloom is past, dried in the sun after the tops are removed, and stored in the cellar as are potatoes. The tubers are laid on the side when planted and covered about 6 inches deep. Plants are commonly set about 3 or 4 feet apart. The tall varieties may need staking, as they are likely to be tipped over and broken by wind; but if the tip or center of the plant is pinched out after two or three joints have grown, it may stand alone.

Some of the races of dahlia are grown readily from seeds, which, in the North, may well be started under glass. The single dahlias come well by this method and give good bloom the same year in late summer and autumn. The plants produce tubers, and these may be employed for further propagation, or a new lot may be grown each year from seed.

For more rapid propagation and particularly for the perpetuation of named varieties, cuttings may be employed. These cuttings may be made of strong stems, cut just below a joint, or by the sprouting of tubers; in either method, the work should be carried under glass and the young plants kept growing until time for setting out in spring. The stem-cutting produces shoots, which should be severed from the cutting when 4 or 5 inches high and treated as independent plants. If roots are employed, they may be placed whole in heat and the shoots taken off and grown independently.

The named varieties are now very many, and there is a special literature about them. Fanciers should be associated with the American Dahlia Society.

arborea: *D. excelsa.*

coccinea. Rather slender, 3–4 ft., st. glaucous: pinnæ or ultimate lfts. ovate-acuminate and sharp-serrate, the rachis narrowly bordered or wingless: rays typically 8 (single), short, broad and nearly or quite obtuse (about 1⅓ in. or less long), scarlet on upper surface and lighter underneath. Mex.

excelsa (*D. arborea*). FLAT TREE D. To 20 ft. or more, st. somewhat woody and glaucous: ultimate lfts. ovate-acuminate, coarsely few-toothed or practically entire: heads erect, opening flat, 4–5 in. across, rays about 8, purplish or crimson-pink. Mex.—Little known within our limits.

glabrata: *D. Merckii.*

imperialis. Bell Tree D. Candelabra D. Sts. few, often single and not greatly branched, to 20 ft., more or less woody: ultimate lfts. ovate, rather sharply and finely serrate or toothed: heads nodding, 4–7 in. across, bright lilac or light reddish, rays about 8 and forming a bell-shaped corolla-like bloom. Mex.—Thrives in S. Calif., and can be fld. in the N. if tubbed and taken inside in autumn.

Juarezii. Cactus D. To 4 ft. or so: double or semi-double, most or all the long rays with recurved margins, irregular in length and overlapping, usually brilliant scarlet. Intro. from Mex.; commonly said to be a hybrid, but this origin is undetermined; see *D. Popenovii.*

Maxonii. Tree dahlia, to 18 ft., becoming more or less woody: ultimate lfts. lanceolate and conspicuously long-acuminate, dentate: heads erect, rays 8, opening flat, lavender-pinkish or lilac, ovate, to 2 in. long. S. Mex., Guatemala, where it is used for hedges.—Runs into white and also double; has bloomed in S. Calif.

Merckii (*D. glabrata*). Bedding D. Slender and glabrous, 2–3 ft., with finely cut foliage: ultimate lfts. or segms. 1–2 in. long and nearly as broad, mostly few-toothed or -serrate, more or less blunt: heads erect, 1–2 in. across, rays (single) lilac, short and nearly or quite obtuse. Mex.

pinnata (*D. rosea. D. variabilis*). Common or Garden D. Bush dahlia to 4 or 5 ft.: ultimate pinnæ ovate, crenate-dentate, grayish underneath, rachis more or less winged: heads horizontal or somewhat nodding, 2–4 in. or more across, much doubled and modified and various in color; rays probably originally 8 and rose-color or lilac. Mex.—Now runs into numerous forms in several classes.

Popenovii. A single-fld. bush dahlia, 3–4 ft.: ultimate lfts. or segms. ovate to oblong-ovate, sparsely hairy, dentate: heads erect or at length recurved or nodding, to 3½ in. across; rays 8, single and of the cactus type, long and narrow-revolute, scarlet or cardinal. Guatemala.—Supposed ancestor of the cactus dahlias (*D. Juarezii*); it has been raised in this country.

rosea: *D. pinnata.*

variabilis: *D. pinnata.*

Zimapani: *Cosmos diversifolius.*

DAHLIA, CLIMBING-: *Hidalgoa Wercklei.* **Sea-**: *Coreopsis* (*Leptosyne*) *maritima.*

DAHOON: *Ilex Cassine.*

DAIS. *Thymelæaceæ.* Deciduous shrubs with simple lvs. and bisexual fls. in terminal heads, the tubular calyx corolla-like; one species is grown out-of-doors in S. Calif. and S. Fla. Propagated by cuttings of half-ripened wood.

cotinifolia. To 18 ft.: lvs. obovate or oblong, 2½ in. long: fls. pink, fragrant, ¾ in. long, hairy outside, the heads long-stalked. S. Afr.

DAISY: *Chrysanthemum.* **African**: *Arctotis stœchadifolia, Lonas inodora.* **Barbeton**: *Gerberia Jamesoni.* **Blue**: *Felicia amelloides.* **English**: *Bellis perennis.* **Globe-**: *Globularia trichosantha.* **Michælmas**: *Aster.* **Orange**: *Erigeron aurantiacus.* **Seaside**: *Erigeron glaucus.* **Swan River**: *Brachycome iberidifolia.* **Transvaal**: *Gerberia Jamesoni.* **True**: *Bellis perennis.* **Turfing**: *Matricaria Tchihatchewii.* **White**: *Layia glandulosa.* **Yellow**: *Rudbeckia hirta.*

DAISY-TREE: *Olearia.*

DALBERGIA. *Leguminosæ.* Trop. trees or climbing shrubs with alternate pinnate lvs., small papilionaceous fls. in terminal or axillary panicles, and flattened pods; many species furnish valuable timber. Only one intro. into the subtrop. parts of the U. S. Propagated by seeds or cuttings.

Sissoo. Sissoo. Deciduous tree to 80 ft.: lvs. of 5 nearly orbicular abruptly acuminate lfts.: fls. yellowish-white, in short axillary panicles: pods to 4 in. long. India.

DALEA (*Parosela*). *Leguminosæ.* Herbs or shrubs native to N. and S. Amer., mostly in dry and sometimes desert locations: lvs. pinnate or simple, glandular-dotted: fls. papilionaceous, purple, white or yellow, in spikes or racemes. Sometimes transferred to grounds.

frutescens. To 2 ft., shrubby: lfts. 13–17: fls. violet, in spikes to ¾ in. long. Tex. to Mex.

Schottii. To 8 ft., shrubby, somewhat spiny: lvs. simple, linear, to 1¼ in. long: fls. dark blue to purplish, in racemes to 4 in. long. Colorado desert, Calif. to Lower Calif.

spinosa. Smoke-Tree. Characteristic ash-gray shrub or small tree of the Colorado desert, to 25 ft., with few lvs. that soon fall leaving a bare very stiff-spiny effect: fls. violet-purple.

DALECHAMPIA. *Euphorbiaceæ.* Trop. monœcious shrubs, often climbing, with alternate simple lvs. and small fls. without petals borne in dense clusters with 2 colored involucral bracts; one species grown in the greenhouse. Propagated by cuttings.

Roezliana. To 4 ft., erect, much branched: lvs. oblanceolate, 6 in. or more long, entire or with coarse teeth above middle: fls. yellow; bracts rose, to 2½ in. long, toothed. Mex. Var. **alba** has white bracts.

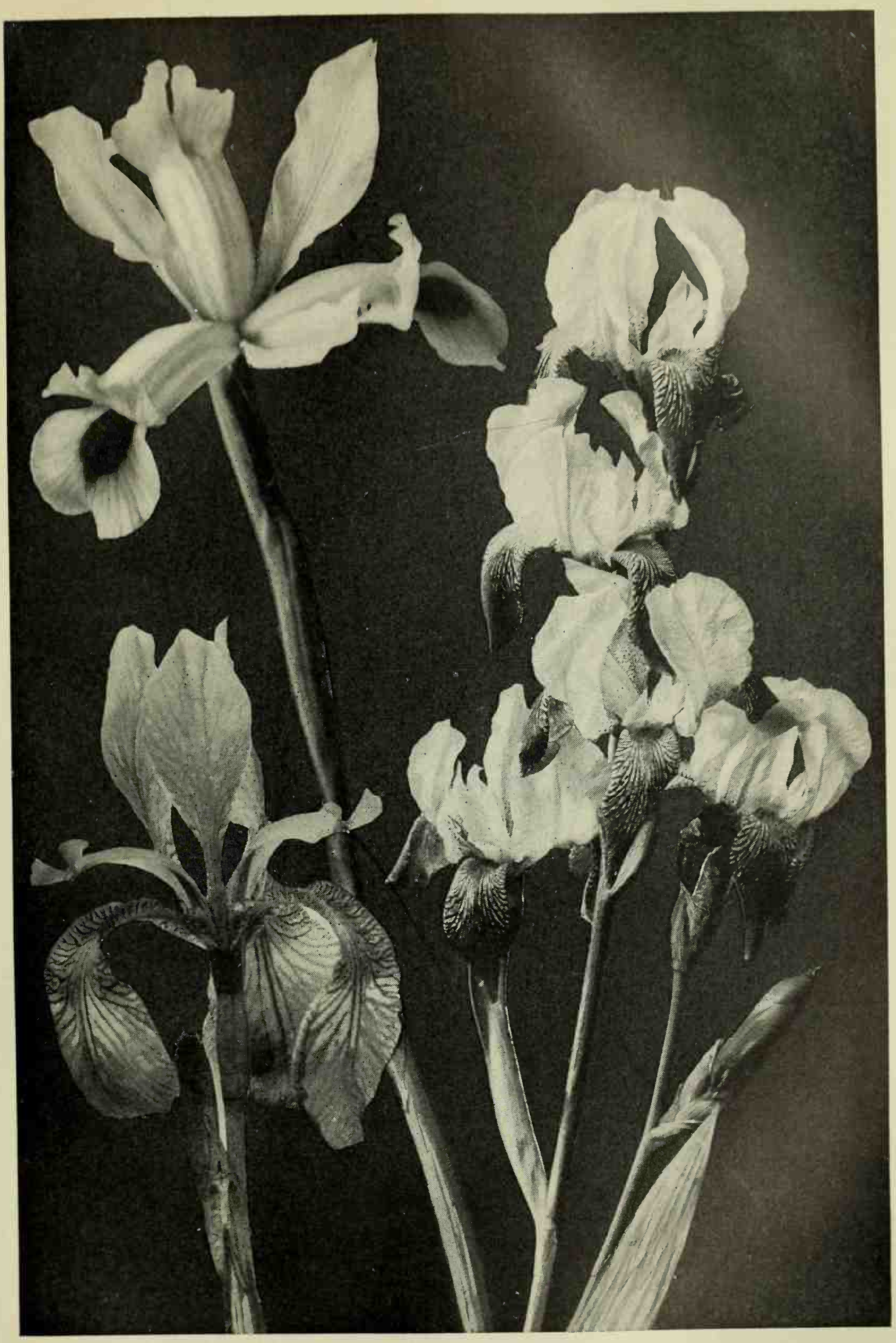
DALIBARDA. *Rosaceæ.* One simple-lvd. per. herb native in N. E. N. Amer., sometimes transplanted to the rock-garden or border where it grows well in sheltered positions in rich or woodsy soil. **D. repens** (*Rubus Dalibarda*). Tufted and creeping, pubescent: lvs. heart-shaped, to 2 in. across, wavy-toothed: fls. white, to ½ in. across, 1–2 at tip of scape, June–Sept.

DANAË. *Liliaceæ.* One evergreen shrub native in S. W. Asia and sometimes planted as an ornamental. **D. racemosa** (*Ruscus racemosus*). Alexandrian-Laurel. To 3 ft.: lvs. scale-like, the apparent lvs. being modified branches to 4 in. long and 1 in. wide: fls. white, small, in short terminal racemes: fr. a red berry. For *D. androgyna*, see *Semele.*

DANDELION (*Taraxacum officinale*). The common dandelion is often gathered for greens. Improved large-leaved horticultural forms are grown as an autumn and spring vegetable, the plants attaining a large size and the leaves more tender. The seed may be selected from the best field-growing plants, but it is better to purchase the French seed of seedsmen. Sow in spring in well-manured soil, either in drills or in hills 1 foot apart. A cutting of leaves may be had in September or October, and some of the stools may stand until spring. The delicacy of the leaves may be improved by blanching them, either by the use of boards or earth. The plant is usually not left the second year.

DANGLEBERRY: *Gaylussacia frondosa.*

DAPHNE. *Thymelæaceæ.* European and Asian shrubs, sometimes evergreen, with alternate (unless noted opposite) simple and entire lvs., white, purple or lilac bisexual fls. in short racemes or clusters, often preceding the lvs., and fr. a little drupe; grown out-of-



VI. IRIS, IN THREE CLASSES. — Left, *Iris sibirica*. Center, *Iris Xiphium*. Right, Candelabre, one of the tall bearded horticultural irises

doors or under glass; some of them are very low and good for borders or rockeries. Most of them are hardy to N. Y. and New England.

A well-drained light soil is best or for forced plants a compost of peat and loam. Propagated by seeds sown at once or stratified; by softwood cuttings or the evergreen species by hardwood cuttings taken in fall and carried till spring in a cool greenhouse; or by grafting in winter on seedling stocks or roots. Layers may also be employed; compost should be used in place of soil for 2 or 3 inches about the plant, removed the following spring and the small white buds planted in pots of fine soil.

alpina. From 6 in. to 1½ ft., deciduous: lvs. to 1½ in. long, pubescent: fls. white or pinkish, fragrant, in terminal clusters, May–June. Eu.

altaica. Small deciduous shrub: lvs. oblanceolate to oblong, to 2½ in. long, glabrous: fls. white, little scented, few in terminal clusters, May and June. Siberia.

Blagayana. To 1 ft., evergreen: lvs. to 1¾ in. long: fls. creamy-white, fragrant, in terminal clusters in early spring. Mts. of Eu.

caucasica. To 5 ft. or more, deciduous: lvs. oblanceolate to lanceolate, to nearly 2 in. long: fls. white, pubescent outside, fragrant, in terminal heads. Caucasus.

Cneorum. To 1 ft., with trailing branches, evergreen: lvs. to 1 in. long: fls. pink, fragrant, in terminal clusters in early spring. Mts. of Eu.

Fioniana: probably of hybrid origin: fls. lilac.

Genkwa. To 3 ft., deciduous: lvs. opposite, to 2 in. long: fls. lilac, in clusters along branches of previous year, before the lvs. China.

Gnidium. To 6 ft., evergreen: lvs. linear-lanceolate: fls. yellowish-white, fragrant, in terminal panicles. S. Eu.

Laureola. Spurge-Laurel. To 3 ft., evergreen: lvs. to 3 in. long: fls. yellowish-green, in almost sessile racemes, in early spring. S. Eu., W. Asia.

Mezereum. To 4 ft., deciduous: lvs. to 3 in. long: fls. lilac-purple, fragrant, in clusters along branches of previous year, in early spring before the lvs.: fr. scarlet. Eu., W. Asia. Var. **alba** has white fls. and yellow fr.

odora. To 4 ft., evergreen: lvs. to 3 in. long: fls. white to purple, very fragrant, in dense terminal clusters, very early. China, Japan. In var. **marginata** the lvs. are bordered with yellow.

oleoides. To 3 ft., pubescent, evergreen: lvs. elliptic, obovate to lanceolate, to 1½ in. long, becoming glabrous above: fls. white or pale lilac, pubescent outside, about ½ in. long. Medit. region; not hardy N.

DAPHNIPHYLLUM. *Euphorbiaceæ.* Smooth evergreen small trees or shrubs with simple leathery lvs., diœcious fls. without petals borne in axillary racemes, and fr. a 1-seeded drupe.

The one species mostly planted in this country (*D. macropodum*) withstands several degrees of frost but requires winter protection; it is a small tree or shrub for the southern states and California. Propagated by cuttings or seeds if procurable.

humile. To 5 ft.: lvs. elliptic to oblong, to 5 in. long: fr. dark blue. Japan.

macropodum. To 30 ft. and more: twigs red: lvs. oblong, to 8 in. long: racemes to 4 in. long: fr. black, with a bloom. China, Japan.

DARLINGTONIA. *Sarraceniaceæ.* One per. insectivorous herb native in Calif. and Ore., sometimes grown as a curiosity. It requires a moist cool atmosphere and abundant water at the roots. It may be grown out-of-doors in the N. with winter protection. Propagated by division of roots or by seeds. **D. californica** (*Chrysamphora californica*). California Pitcher-Plant. To 3 ft.: lvs. or pitchers in basal rosettes, tubular, with an arched white-spotted hood and a 2-forked appendage: fls. yellowish to dark purple, 1¼ in. long, solitary.

DARNEL: *Lolium temulentum.*

DARWINIA. *Myrtaceæ.* Evergreen shrubs native in Australia and sometimes planted in Calif.: lvs. opposite or scattered, small and entire: fls. red or white, small, sometimes subtended by showy bracts. Propagated by cuttings taken from tips of side shoots, in spring or fall.

citriodora. To 2 ft., diffuse: lvs. nearly opposite, oblong to ovate-lanceolate, to ½ in. long: fls. in terminal heads with involucre of bracts slightly colored.

Scheurmanni. Much branched procumbent shrub: lvs. opposite, linear, ½ in. or less long: fls. solitary on very short pedicels in axils.

thymoides. Diffuse and much branched low shrub: lvs. commonly opposite, lanceolate or narrower, margins revolute, ⅛ in. or less long: fls. in terminal heads of 4–8, the bracts shorter than fls. and soon falling.

DASHEEN: *Colocasia esculenta.*

DASIPHORA: *Potentilla fruticosa.*

DASYLIRION. Sotol. *Liliaceæ.* Stiff desert tree-like plants having linear usually spiny-margined lvs. and small whitish fls. in dense panicled racemes; useful in desert work, or in formal plantings in dry warm regions; sometimes seen under glass as curiosities. The lvs. are utilized for thatching and baskets, the fiber is made into cordage, the heads are eaten, and an alcoholic beverage is extracted from the trunks. Of easy cult. as for yucca, to which they are related; propagated by seeds and cuttings.

acrotriche. Trunk 3 ft. or more: lvs. to 3 ft. long, ½ in. wide: infl. to 15 ft. high. Mex.

glaucophyllum. Trunk short: lvs. 3 ft. or more long, ½ in. wide, glaucous: infl. to 18 ft. high. Mex.

graminifolium. Lvs. about 3 ft. long and ½ in. broad, green and glossy, prickles very short and yellowish-white. Mex.

longifolium: *Nolina longifolia.*

longissimum (*D. quadrangulatum*). Trunk to 6 ft.: lvs. 6 ft. long and ¼ in. wide: infl. to 20 ft. high. Mex.

quadrangulatum: *D. longissimum.*

serratifolium. Stemless or nearly so: lvs. to 3 ft. long and 1½ in. wide, glaucous. Mex.

texanum. Trunk short or underground: lvs. 2–3 ft. long and ½ in. broad, glossy-green, the prickles yellow turning brown: infl. to 15 ft. high. Tex., Mex.

Wheeleri. Trunk to 3 ft.: lvs. to 3 ft. long and 1 in. wide: infl. to 16 ft. high. Tex., Ariz., Mex.

DASYSTEPHANA: *Gentiana.*

DASYSTOMA: *Aureolaria pedicularia.*

DATE (*Phœnix dactylifera*). A fruit of very ancient cultivation by the Arabs and others in the arid regions of the Old World, principally northern Africa, where moisture is supplied by spring or underground water or by irrigation. High temperatures are required in the growing and ripening season. The date of commerce is the naturally dried drupe of the palm, borne in heavy clusters. Dates are now grown in considerable plantations in southern California and Arizona, and undoubtedly adapted to many parts of Texas and other regions. The date palm is also widely planted as an ornamental tree in humid tropics and warm-temperature regions. When well established the tree withstands several degrees of frost.

The date is diœcious,—the male or staminate flowers on one tree and the females or pistillates on another tree. Seedless dates may be produced without pollination but they are inferior. Pollination takes place by the agency of wind but the results are uncertain and too many staminate or sterile trees are required. One male tree to about 100 females is sufficient if hand-pollination is practiced. This process consists in tying a piece of staminate inflorescence a few inches long, bearing 30 or more flowers, to the female cluster; as not all the female flowers in a cluster open at the same time, this operation needs to be repeated.

Propagation is by seeds and suckers, the latter being the prevailing method for the multiplication of particular or named varieties; and without as careful attention to varieties as with oranges or apples the rewards of date culture are small or negligible. The suckers arise about the base of the tree mostly before it reache full bearing age, but may spring from the trunk later on to 10 or more feet above ground. The sex of the sucker will of course be that of the tree from which it arises. The suckers are moved when three to six years old, mostly in spring when the ground is warm, the tops being headed back. Experience is required to assure uniform successful results. The cutting of offshoots extends from the first five to ten years of the mother palm's life. If many suckers are removed at one time, it may require two years for the parent to recover, with consequent loss of fruit; and leaving the suckers on the tree also retards fruiting.

Trees grown from suckers should bear considerably in five or six years, depending on soil, location and treatment. At ten to fifteen years the tree should be in full bearing and continue indefinitely, yielding 100 to 200 pounds annually. Trees may be planted about 30 feet apart.

Some dates under good conditions ripen naturally on the tree, but the fruits are likely to cure unevenly and for the most part the bunches are cut intact and matured in a warm place, not unlike the handling of bananas. Special ripening processes have been developed for superior results.

DATE, JERUSALEM: *Bauhinia monandra.*

DATISCA. *Datiscaceæ.* Per. herbs resembling hemp in habit, one sometimes planted for ornament: lvs. alternate, compound: fls. diœcious, in clusters or the pistillate in racemes. Propagated by seeds and division.

cannabina. To 7 ft.: lvs. pinnate, lfts. 7–11, linear-lanceolate, to 4 in. long, toothed: fls. yellow, small. Asia Minor to India.

DATISCACEÆ. DATISCA FAMILY. Three genera of trees or herbs in Asia, Eu. and W. N. Amer.: lvs. simple or compound: fls. mostly diœcious, of 4–9 sepals, no petals, 4–25 stamens, 1-celled ovary: fr. a caps. Placed near the Begonia family in the systematic schemes, although the plants lack such external resemblances. Datisca is rarely cult.

DATURA (incl. *Brugmansia*). *Solanaceæ.* Big bushy coarse erect annuals, shrubs or small trees, mostly strong-smelling, sometimes grown for ornament, also medicinal: lvs. large, simple, entire or coarsely toothed: fls. large, trumpet-shaped, erect or drooping, red, white, yellow, violet: fr. a mostly prickly or spiny caps. There are two groups: one with the calyx breaking apart near base and left as cup or crown on the fr. (circumscissile); the other with calyx splitting lengthwise down one side (spathe-like).

The annual daturas are propagated by seeds usually sown indoors in the spring in the North; the perennials from seed and from cuttings, the latter preferably taken with a heel.

ægyptiaca: *D. Metel.*

arborea. ANGELS-TRUMPET. Small tree: lvs. ovate-lanceolate, to 8 in. long, soft-hairy, in pairs: fls. white nerved with green, to 9 in. long, hanging, solitary, with musk-like odor; calyx spathe-like: fr. unarmed, 2½ in. long. Peruvian Andes.

ceratocaula. Fleshy, with thick st. and horn-like branches: lvs. pinnately lobed, mealy beneath: fls. large, erect, white stained blue; calyx spathe-like: fr. more or less pendent, smooth. Aquatic plant of Mex. and Cent. Amer.

chlorantha. Shrub: lvs. broad-ovate: fls. yellow, drooping: fr. prickly. Habitat unknown.—Probably a form of *D. Metel.*

coccinea: *D. DeNoteri.*

cornigera (*D. Knightii*). To 4 ft., branches downy: lvs. ovate: fls. drooping, very fragrant at night, white or creamy-white; calyx with a long spur. Mex.

cornucopia: *D. Metel.*

De Noteri (*D. coccinea*). Probably ann., 3 ft.: fls. fragrant, bright red, freely produced. S. Afr.—Of uncertain botanical identity.

fastuosa: *D. Metel.*

ferox. Sts. red at base: lvs. ovate, angled: fls. light blue. S. Eu.

humilis: *D. Metel.*

inermis: a form of *D. Stramonium* with spineless pods.

Knightii: *D. cornigera.*

Metel (*D. fastuosa. D. cornucopia. D. ægyptiaca*). Ann. to 5 ft.: lvs. ovate-lanceolate, to 8 in. long, solitary or upper ones paired: fls. to 7 in. long, whitish within, violet outside to yellowish, often double; calyx purple, circumscissile: fr. spiny, nearly globose, 1¼ in. diam. India; nat. in tropics of both hemispheres. Var. alba, fls. white; cærulea, fls. blue; **Huberiana,** fls. blue, yellow and red. *D. humilis flava fl.-pl.* also belongs here.

meteloides (*D. Wrightii*). Per. cult. as ann., to 3 ft., grayish-pubescent: lvs. ovate, to 7 in. long: fls. erect, to 8 in. long, white tinged with rose or violet, fragrant; calyx circumscissile: fr. nearly globose, 2 in. across, with sharp spines. Tex. to Calif. and N. Mex.

sanguinea. Tree-like shrub to 12 ft.: lvs. narrow-oblong, clustered, 7 in. long, soft-hairy, shining green above: fls. drooping, to 10 in. long, brilliant orange-red with yellow nerves, not fragrant; calyx spathe-like: fr. unarmed, 3½ in. long, top-shaped; seeds with narcotic properties. Peru.

Stramonium. JIMSON-WEED (Jamestown-weed). Ann. to 5 ft.: lvs. ovate, to 8 in. long, lobed: fls. erect, white or violet, 4 in. long; calyx circumscissile: fr. 2 in. long, very prickly. Tropics; nat. in N. Amer.

suaveolens. Tree-like shrub to 15 ft.: lvs. ovate-oblong, to 1 ft. long: fls. nodding, white, to 1 ft. long; calyx spathe-like: fr. unarmed, spindle-shaped, 5 in. long. Brazil.—Usually cult. as *D. arborea.*

Tatula: the purple-fld. form of *D. Stramonium.*

Wrightii: *D. meteloides.*

DAUBENTONIA. *Leguminosæ.* Shrubs or trees with pinnate lvs., yellow or rose papilionaceous fls. in axillary racemes, and 4-winged or -angled pods; the first-named species is grown out-of-doors in warm climates.

punicea (*Sesbania punicea*). To 6 ft. or more: lfts. 12–14, to 1 in. long: fls. red-purple, to ¾ in. long, in showy racemes to 4 in. long: pods to 4 in. long, 4-winged. Fla. to Miss., intro. from S. Amer.

Tripetii (*Sesbania Tripetii*). To 6 ft.: fls. orange-red with scarlet standard yellow-spotted at base, in drooping racemes. Argentina.

DAUCUS. *Umbelliferæ.* Herbs with pinnately decompound lvs., small white or yellowish fls. in compound umbels, and ovate or oblong frs.; one grown for the edible root.

Carota var. **sativa.** CULTIVATED CARROT. Ann. or bien., to 3 ft., with thick, fleshy, orange-colored roots: lvs. finely cut into many narrow segms.: umbels usually globose, thus differing from the flatter umbels of the common wild form, subtended by leaf-like bracts which are pinnately cut into fine divisions. See *Carrot.*

DAVALLIA. *Polypodiaceæ.* Mostly small trop. ferns of the Old World, with finely divided foliage, chaffy creeping rhizomes that often spread on the surface of the soil or cling over the side of the pot; sori at or near margins of segms. Often grown in hanging-baskets or as fern-balls. Old plants may be divided; ordinarily grown in shallow pans in temperature 60–65°; it is often necessary to fasten the rhizomes down. See *Ferns.*

affinis: the plant grown in gardens under this name is *D. dissecta.*

bullata. SQUIRRELS-FOOT-FERN. BALL-FERN. Creeping brown-hairy rhizomes: lvs. to 10 in. long and 6 in. wide, deciduous, 4-pinnatifid, segms. sharp-toothed, often sold as fern-balls. Malaya, India, Japan.

canariensis. Rhizomes pale brown, crooked: lvs. to 1½ ft. long and 1 ft. wide, 4-pinnatifid, segms. not sharp-toothed at apex. Canary Isls. to Spain and N. Afr.

denticulata. Lvs. to 2 ft. long and 15 in. wide, 3–4-pinnatifid, leathery and shining. Trop. Asia and Afr.

dissecta. Rhizomes extensively creeping: lvs. to 1½ ft. long and 1 ft. wide, 4-pinnatifid, segms. sharp-toothed. Java.

elegans: the plant known to hort. under this name is *D. dissecta.*

fejeensis. Lvs. evergreen, to 1 ft. long, triangular, 4-pinnatifid into linear segms., drooping with age. Fiji Isls. Var. **plumosa** is feathery and more gracefully drooping.

Griffithiana. Rhizome creeping, covered with white or yellowish scales: lvs. to 1 ft. long and 8 in. wide, 3–4-pinnatifid, segms. toothed or cut. India, S. China.

lucida: *D. solida.*

Mooreana: *D. pallida.*

pallida (*D. Mooreana*). Lvs. to 3 ft. long, on straw-colored stalks to 1½ ft. long, 4-pinnatifid, segms. triangular. Aneiteum and Borneo.

pentaphylla. Lvs. 1-pinnate into 5 or more wavy-toothed segms. to 6 in. long and ½ in. wide. Java, Polynesia.

pyxidata. Lvs. about 1 ft. long and 9 in. wide, 3–4-pinnatifid, leathery and shining. Australia.

solida (*D. lucida*). Lvs. to 2 ft. long and 1½ ft. across, 3-pinnatifid. Malaya.

tenuifolia: *Odontosoria chinensis.*

DAVIDIA. *Nyssaceæ.* One Chinese deciduous pyramidal tree to 50 or 60 ft., hardy as far north as Mass. **D. involucrata.** DOVE-TREE. Lvs. alternate, broad-ovate, to 6 in. long, toothed: fls. monœcious or essentially so, without petals, in dense heads ¾ in. across subtended by 2 unequal creamy-white drooping showy bracts, the larger to 6 in. long, in May or June: fr. a green bloomy drupe to 1½ in. long. Var. **Vilmoriniana** differs in having lvs. glabrous instead of silky-pubescent beneath.—Propagated by seeds, cuttings of half-ripened wood, and by layers.

DAWN-FLOWER, BLUE: *Ipomœa Leari.*

DAY-FLOWER: *Commelina.*

DAY-LILY: *Hemerocallis.*

DEAMIA. *Cactaceæ.* One cactus climbing or clambering on trees and rocks, S. Mex. to Colombia, **D. testudo** (*Cereus testudo*): joints to 4 in. or more broad usually with 3 wide wings but sometimes 5–8-ribbed, making aerial roots; spines 10 or more and spreading, brownish: fls. diurnal, yellowish-white, to 11 in. long, the tube 4 in. long and slender, expanding broadly.

DEBREGEASIA. *Urticaceæ.* Shrubs and trees native in Asia and Afr., with alternate toothed lvs., unisexual fls. in clusters and fr. a syncarp composed of small fleshy drupes; one species is sometimes grown as an ornamental in the S. Propagated by seeds or by cuttings of young wood under glass.

longifolia (*D. velutina*). To 20 ft.: lvs. lanceolate, to 6 in. long, rough and dark green above, white-tomentose beneath: fr. orange or red, about ⅓ in. across. S. Asia.

velutina: *D. longifolia.*

DECAISNEA. *Lardizabalaceæ.* Two Asian shrubs with odd-pinnate lvs., polygamous fls. in panicled racemes, and fr. of 3 fleshy follicles; one species is grown in U. S., being hardy to N. Y.

Fargesii. To 16 ft.: lvs. of 6–12 pairs of ovate entire lfts. to 6 in. long, glaucous beneath: fls. greenish, 1 in. long, drooping: fr. blue and bloomy, to 4 in. long. China.

DECIDUOUS: falling, shedding as the leaves of non-evergreen trees.

DECKENIA. *Palmaceæ.* One monœcious unarmed feather-palm from the Seychelle Isls. in the Indian Ocean, related to Dictyosperma but differing technically in the subbasilar stigma, 9 connate stigmas, 3-fid pistillode, and in the spines on lvs. and spathes; fr. much compressed. From Acanthophœnix, to which it is sometimes referred, it differs in the flattened rather than globose fr., fewer stamens not with twisted filaments, 3-fid instead of 2-fid pistillode, spadix much larger, and other technical characters. **D. nobilis** (*Acanthophœnix nobilis*). Tree to 120 ft. in its native isls.: lvs. to 12 or more ft. long; long lf.-sheath usually spiny; midrib and pinnæ bristly when young and usually retaining some bristle-hairs when old, midrib yellowish: branches of infl. very slender and drooping: fr. ½ in. long. —It has been grown under glass in U. S., and is probably hardy in parts of S. Fla.

DECODON. *Lythraceæ.* One per. somewhat woody herb, native in swamps and about ponds from Me. to Fla. and La., and sometimes planted in wet locations and borders of ponds. **D. verticillatus** (*Nesæa verticillata*).

WATER-WILLOW. SWAMP LOOSESTRIFE. Sts. recurved, to 8 ft. long: lvs. to 5 in. long and ½ in. wide: fls. rose-purple, 1 in. across, in axillary cymes, July–Sept.

DECOMPOUND: more than once compound.

DECUMARIA. *Saxifragaceæ.* Shrubs climbing by aerial rootlets, having opposite lvs. that are deciduous or partially persisting, and small white fls. in terminal corymbs; hardy in the N. only with protection. Propagated by cuttings of young wood under glass or rarely by seeds.

barbara. Tall climber: lvs. ovate, to 4 in. long, glabrous and shining above: corymbs to 4 in. across, May–June. Va. to Fla. and La. along streams and in low grounds.

DECUMBENT: reclining or lying on the ground, but with the end more or less erect or ascending.

DECURRENT: running down along the stem, as the leaf of mullein.

DECUSSATE: opposite leaves at right angles, therefore in four rows up and down the stem; alternating in pairs.

DEERBERRY: *Vaccinium stamineum.*

DEER-BRUSH: *Ceanothus integerrimus.*

DEER-FOOT: *Achlys triphylla.*

DEERINGIA. *Amaranthaceæ.* Herbs and subshrubs, some of them climbing, with alternate ovate lvs. and inconspicuous fls. in terminal panicles; native in Madagascar, Australia and the Pacific Isls.; about a half dozen species, one sometimes planted for ornament.

amaranthoides (*D. baccata. D. celosioides*). Woody climber to 15 ft.: fls. greenish-white: fr. a red globular berry ¼ in. across. Australia; grown in S. Calif. Var. **variegata** has variegated lvs.

Amherstiana: *Bosea Amherstiana.*

baccata: *D. amaranthoides.*

celosioides: *D. amaranthoides.*

DEGUELIA: *Derris.*

DEHISCENCE: the method or process of opening of a seed-pod or anther.

DELONIX. *Leguminosæ.* African trees with 2-pinnate lvs., showy orange or scarlet fls. in corymbose racemes, and great flat woody pods; one very showy species is commonly planted in frostless regions. Cult. as for Cæsalpinia.

regia (*Poinciana regia. Cæsalpinia regia*). ROYAL POINCIANA. PEACOCK-FLOWER. FLAMBOYANT. Wide-branching tree to 40 ft. or more: lfts. numerous and small: fls. bright scarlet, 3–4 in. across, mostly in summer: pods to 2 ft. long and 2 in. or more broad. Madagascar.

DELOSPERMA. *Aizoaceæ.* Segregate from Mesembryanthemum (which see for cult.), native in S. Afr.: per., with lanceolate or narrower sessile soft lvs., the branches matted or plant sometimes stemless and with branching tuberous rootstock: fls. either rather small and white or yellow, or in some species large and purple; stigmas 5.

echinatum (*M. echinatum*). Erect or spreading, 1 ft.: lvs. to ½ in. or more long, hispid, thick: fls. yellowish or white, on hispid peduncles.

Ecklonis (*M. Ecklonis. D. Patersoniæ*). Diffuse, more or less trailing; lvs. pubescent but a nearly or quite glabrous form in cult.: lvs. linear, to 1 in. long: fls. ½ in. and more across, glistening-white.

Patersoniæ: *D. Ecklonis.*

DELOSTOMA. *Bignoniaceæ.* S. American trees or shrubs with simple leathery lvs., funnelform 5-lobed fls. in terminal racemes or panicles, and oblong woody frs.; one species is sometimes grown in S. Calif.

roseum. Lvs. oval or orbicular, to 6 in. long, tomentose beneath: fls. rose or pink, 1½ in. long, in panicles to 8 in. long: fr. dark purple, about 2 in. long. Ecuador, Colombia.

DELPHINIUM. LARKSPUR. *Ranunculaceæ.* Erect per. and ann. herbs of the north temp. zone around the world, of probably 250 or more species, a number of which are interesting and showy flower-garden subjects; lvs. palmate, variously cut and divided. The fls. have a single spur; they are mostly blue, but vary to pink, blush and white in garden races; in some they are naturally scarlet and red and in one of the cult. species are yellow. There are double-fld. strains. The showy outer part of the larkspur fl., including the spur, is the calyx (5 sepals). The petals are smaller interior parts, 2 or 4 in number, the upper pair (sometimes united into 1) having spurs that project into the calyx spur; sometimes the petals are small and crowded in the throat of the fl. like a bee, as in some of the common garden kinds. The Latin names are much confused in Delphinium, particularly in hort. material.

Larkspurs are mostly hardy North, and require no very special attention as to soil and exposure, but do best in open exposure. They come readily from seeds, those of the perennials mostly blooming the year following the sowing. Of the perennial kinds the clumps may be divided in autumn or spring, or cuttings may be made of young shoots in spring or from second growth in summer after the flower-stems have been cut down. Asexual propagation of these kinds is essential in named garden varieties, but otherwise it is well to have fresh stock coming on from seed. As soon as the flowers are gone and before seeding, cut away the flower-stems (unless seeds are desired for sowing); frequently new flower-stems arise and give a second although usually inferior bloom in late summer or autumn. It is well to place sand or sifted coal-ashes about the crowns for winter protection, particularly on moist or heavy soils. The stately candle larkspurs of the *D. elatum* type, with long erect spike-like racemes, are suitable for massing and for back borders, while the lower and loosely branching bouquet and garland kinds are adaptable for beds and front borders. The annual larkspurs bloom readily from seeds sown early in the open; early bloom may be had by sowing indoors and transplanting.

Ajacis. ROCKET L. Erect branching ann., 1–4 ft., root simple or branched: lvs. finely divided, mostly bunched at nodes: fls. blue, white, violet, pink, in long simple racemes, often double: pod normally 1 but often more in cult. forms, pubescent. S. Eu.; popular in flower-gardens and somewhat escaped.

albescens: *D. virescens.*

alpinum. Like *D. elatum* and sometimes referred to it, distinguished by the lower bracts being variously parted and usually rather broad. Eu., Asia.

atropurpureum: *D. elatum.*

azureum: *D. carolinianum, D. cheilanthum, D. elatum*; the name is likely to be applied to any blue-fld. hort. kinds.

Barbeyi (*D. subalpinum*). Stout and mostly simple per., 2–3 ft. and more, usually pubescent: lvs. with few and broad divisions: fls. dark blue, in short and dense raceme, the sepals acuminate and mostly exceeded by the spur; upper petals yellow with blue tinge: follicles 3, glabrous. Wyo., Colo., Utah.—Sometimes planted.

Barlowii. The plant now grown under this name is of the *D. cheilanthum* group, but the original *Barlowii* figured in 1837 is a very double form regarded as *D. elatum* × *D. grandiflorum.*

Belladonna: *D. cheilanthum.*

Bellamosum: *D. cheilanthum.*

bicolor. Erect few-lvd. per. to 20 in., the narrow lf.-divisions obtuse: fls. blue, in a short open raceme; spur somewhat exceeding sepals; upper petals brownish-yellow: follicles 3, glabrous or pubescent. Wyo. north and west.—Sometimes planted in collections.

Brunonianum. Musk L. Per. to 18 or 20 in., musk-scented: lower lvs. reniform and 5-parted, upper 3-parted: fls. large, light blue with much darker margins and center; spur very short: follicles 3 or 4. Himalayas.—Little grown.

Bulleyanum. Per. 2–4½ ft.: lvs. deeply cut, somewhat pubescent: fls. deep blue, spur strongly hooked or nearly horse-shoe-shaped: pods 3, lightly pilose. China.—Little grown.

californicum. Coast L. Root tuberous: st. to 7 ft. high, lightly pubescent: lvs. to 6 in. across, deeply parted and cut: fls. white or whitish, sometimes purplish inside, pubescent, in long dense raceme. Calif., near coast.

cardinale. Scarlet L. Erect or flexuose per. 2–3 ft. and often much more, finely pubescent, making long sts.: lvs. thick, cut into narrow often linear lobes: fls. long-spurred, in very open racemes, bright scarlet with yellowish petals; sepals often ¾ in. long: follicles mostly 3, glabrous. S. Calif.

cardiopetalum (*D. halteratum* var. *cardiopetalum*). Tap-rooted ann. to 20 in.: lvs. divided into linear or oblanceolate segms.: fls. blue, less than 1 in. across, in short terminal racemes, with upwardly projecting spur, petals heart-shaped: follicles 3, nearly or quite glabrous. S. France.

carolinianum (*D. azureum* of botanists). Per., erect, 1–2½ ft., pubescent: lvs. cleft into narrow or linear segms.: fls. blue, pedicelled in open racemes, about 1 in. across, the long spur horizontal or ascending: follicles 3, pubescent; seeds strongly winged. Va. south and west.—Little cult. Some of the plants cult. as *D. carolinianum* are to be associated with the *D. cheilanthum-elatum* series.

cashmerianum. Per., 10–20 in., leafy: lvs. cordate-orbicular in outline, broad-lobed and sharply toothed: fls. blue, pubescent, 1–2 in. long, few and showy in a terminal broad or corymbose cluster, the spur shorter than sepals, slightly curved, obtuse or nearly so: follicles 3–5, hairy. High Himalayas.—Little cult., but distinct. Var. **Walkeri** is a leafy many-fld. short-stemmed form, upper lvs. less lobed or nearly entire, fls. very large and light blue with yellow petals.

caucasicum: *D. elatum.*

cheilanthum. Garland L. Tall leafy per., diffusely much branched above: lvs. with 3 or more deep widely separated mostly narrow divisions (except perhaps the radical ones): infl. open and loose, scarcely spicate; fls. blue, varying to whitish, large and open, at full expansion usually 1½–2 in. across in cult. forms, lightly pubescent, commonly not horizontal; spur ¾–1 in. long and stout and nearly or quite straight; petals open or spreading, blue or dull yellow, lower ones barbate and entire or nearly so: follicles 3, glabrous or pubescent, seeds 3-angled winged on margin, not scaly or only slightly so. Siberia.—Assumed parent of many garden larkspurs, as *azureum*, *Belladonna* (light blue), *Bellamosum* (dark blue), *cœlestinum*, *formosum.*

chinense: *D. grandiflorum.*

cœlestinum: *D. cheilanthum.*

cœlestis: hort. name for a clear blue; probably without exact application.

columbianum (*D. Nuttallii*). Roots fascicled and thickened: similar to *D. Menziesii* but glabrous or nearly so except in infl. which is somewhat hairy or perhaps viscid, herbage more or less glaucous, follicles erect: fls. dark blue, not large, in a slender spike. Ore., Wash.

Consolida. Forking L. Tap-rooted ann. to 1½ ft., forking rather than racemose: lvs. scattered, with linear divisions: fls. few, terminating the branches, 1 in. or more across, blue or violet: follicle 1, glabrous. Eu.—Little cult., the stock usually going under this name being *D. Ajacis.*

cultorum. A collective name proposed by Voss in 1896 for the florists or garden larkspurs, that cannot be readily referred to botanical species; many of them bear double and semi-double fls. These plants are of two groups, the true candle or spicate larkspurs to be associated with *D. elatum* and the garland larkspurs to be associated with *D. cheilanthum.* These two groups are apparently now somewhat confused from long cult. and breeding; other elements may have entered into the hort. kinds.

dasyanthum. Per. to 1½ ft., more or less pubescent: lvs. reniform to nearly orbicular and 5-angled or sometimes palmately 5-lobed, to 4 in. across, glabrous except on margins and nerves: fls. deep blue, rather large, the spur incurved at apex. Siberia.

decorum. Slender or lax per., 6–20 in., nearly or quite glabrous: lvs. few, cut or parted into narrow lobes, the basal ones shallowly cleft into broad segms.: fls. blue, petals tinged yellow, in loose often somewhat panicled racemes: follicles 3, glabrous. Calif.—Little cult.

divaricatum. Very diffuse mostly simple-rooted ann., to 2 ft.: lvs. few, much divided into short narrow segms.: fls. purplish, ¾ in. across, terminal on the branches, spur long and straight and acute: follicles 1, pubescent. S. W. Asia.

Duhmbergi: *D. elatum* var.

elatum (*D. intermedium*). Bee L. Candle L. Tall and very erect per. to 6 ft. and more, the branches usually fastigiate: lvs. with broad mostly close or contiguous divisions that are sharply cut at the top: infl. a long more or less close spike-like raceme, the fls. on ascending not elongated pedicels; lower bracts very narrow, entire: fls. blue, little or not at all pubescent, usually not opening widely, 1 in. or less across, spur equally or slightly exceeding the sepals and slender and slightly curved and usually horizontal; petals small and closing the throat, brownish-purple, the lower pair bifid and yellow-barbate: follicles 3, lightly pubescent to glabrous; seeds widely winged, not scaly. Germany to Mongolia.—Presumed parent of the tall larkspurs with elongated spike-like clusters and relatively small fls.; it often persists in old yards. Plants cult. as *atropurpureum*, *azureum*, *caucasicum*, *formosum*, *hybridum*, *Maackianum* are to be associated here. Var. **Duhmbergi** has glabrous follicles and usually colored broad bracts and bractlets.

exaltatum. Slender per., to 5 or 6 ft., nearly or quite glabrous: lvs. with 3–5 narrow divisions usually cleft or toothed toward apex: fls. blue or purple, ¾ in. long, in long mostly dense terminal racemes; spur about ⅓ in. long and straight: follicles 3, pubescent. Woods, Pa. to Minn., Neb., Ala.—Seldom planted.

fissum: *D. hybridum.*

formosum. The true *D. formosum* (of botanists) appears not to be cult., at least outside botanical collections. Plants so named in gardens are mostly forms of the *cheilanthum* group but sometimes of the *elatum* class.

Geyeri. Erect per. to 2½ ft.: lvs. mostly near base, much divided into linear lobes: fls. deep blue, sepals ½–¾ in. long; upper petals yellow: follicles usually 3, pubescent. Colo., Wyo., Utah.—Little planted.

glabellum: a name without botanical definition.

glaucum (*D. scopulorum* var. *glaucum*). Three to 6 ft., leafy, more or less glaucous: lvs. to 6 in. across, deeply 5–7-parted: racemes to 18 in. long; fls. blue or purplish: follicles glabrous. Calif., north.

grandiflorum (*D. chinense*). Bouquet L. Much branched forked per. but often blooming first year from seeds, to 2 or 3 ft. or more: lvs. cut into many linear segms. making a fine feathery foliage: infl. open, diffuse, and fls. scattered or sometimes short-racemose on ends of main branches and on long spreading pedicels; fls. blue, varying to white, opening wide, 1–1½ in. across, the slightly curved or straight spur equalling or exceeding the sepals; upper petals color of sepals or sometimes yellowish: follicles 3, pubescent. Siberia-China.—One of the commonest garden larkspurs, often dwarf.

halteratum. Like *D. cardiopetalum* but petals suborbicular and not heart-shaped. Medit. region.

hybridum. Plants in cult. under this name are likely to be forms of other species, as of the *D. cheilanthum* and *D. elatum* groups. The true *D. hybridum* (*D. fissum*) is probably not in the gardens; it is a tall pubescent plant with somewhat bulbous root, seeds orbicular in transverse section and neither scaly or winged (in *D. elatum* 3-angled and winged). S. E. Eu. to Turkestan.

imperialis: hort. name, probably for candle larkspurs.

intermedium: *D. elatum.*

Maackianum. The plant in gardens under this name is an *elatum* larkspur. The true *D. Maackianum* with sheathing petioles, lvs. pubescent both sides, infl. loosely paniculate, upper petals minute, seeds scaly, is apparently not in hort. cult.

Menziesii. Small per. with a cluster of thickened roots although sometimes reaching 2 ft., white-puberulent at least above: lvs. small, cut into linear divisions: fls. blue, 1 in. across, more or less pubescent outside, scattered or few in a loose raceme, spur about equalling the sepals: follicles 3, pubescent or glabrous, spreading. Ida., B.C., Calif.—Sometimes planted.

mesoleucum: a name of uncertain application.

Moerheimi: a garden name, probably for a form of the *cheilanthum-elatum* group.

Nelsoni. Per. to 1½ ft., with tuberous roots, slender, more or less pubescent: lvs. parted into linear lobes: fls. blue, in an open terminal raceme, somewhat hairy, lower petal 2-cleft and with tuft of hairs. Neb. to B. C.

Nortonianum. Very tall, even to 4 and 5 ft., strict, bearing long open racemes of deep bluish-purple fls.: follicles 3, large, lightly pubescent. Ozark region, Mo.—Has been referred to *D. carolinianum.*

nudicaule. Red L. Slender per. to 2 ft., told from *D. cardinale* by the broad mostly obtuse divisions of the lvs., which are few on the sts.: fls. long-spurred, red, sepals ⅓–½ in. long, petals mostly yellow: follicles puberulent, becoming glabrous. Ore., Calif.—Little planted.

Nuttallianum (*D. pauciflorum*). Slender per., 6–18 in., with tuberous root: lvs. small, little more than 1 in. broad, with deep linear lobes: fls. small, in raceme, blue; sepals ¼ in. long, upper petals whitish: follicles 3, glabrous. Wyo., Utah, Ore., Wash.—Little planted.

Nuttallii: *D. columbianum.*

occidentale. Stout erect per. to 6 ft. or more: lvs. 3–6 in. broad, pubescent both sides, with 3–7 rhombic-cuneate sharply cut divisions: fls. dark blue, in a many-fld. panicle, the sepals ½ in. or more long, viscid outside; upper petals yellowish: follicles 3, glabrous or pubescent. Mts., Wyo., Ida., Colo., Utah.—Sometimes planted.

oxysepalum. Per., st. simple and erect, 12–20 in.: lvs. palmately 5-parted into incised lobes: infl. 10–12-fld., racemose; fls. pale blue, spur incurved and shorter than the long-acuminate sepals (about 1 in. long); petals brownish: follicles glabrous or nearly so. E. Eu.—Little known in cult.

Parryi. Mostly simple per., 1 to 3 ft.: lvs. 3–5-parted, the lobes linear or nearly so and usually obtuse: fls. deep blue, in a raceme; sepals and spur ½ in. long: follicles puberulent. S. Calif.—Infrequently planted.

pauciflorum: *D. Nuttallianum.*

Penardi. Erect per., 10–20 in., whitish-pubescent, the lvs. mostly basal and much divided into narrow lobes: fls. white, in a short open raceme; spur about 1 in. long and much exceeding sepals, nearly vertical: follicles 3, pubescent. Colo. to Tex. and Ariz.—Sometimes planted.

Przewalskii. Glabrous erect per., 6–10 in.: lvs. deeply 3–5-parted and again divided: fls. blue, few, terminal; spur straight or curved and about ¾ in. long and equalling sepals; upper petals dark brownish, lower ones with white and yellow hairs: follicles 3, hairy. Mongolia.

Pylzowi. Silky-pubescent leafy per. 4–10 in.: lvs. divided into oblong or linear acute parts: fls. few (1–3), terminal, large, violet-blue; spur 1 in. long and straight or curved at tip and equalling or exceeding the hairy sepals; petals dark violet: follicles villous. China.

pyramidale: hort. name, apparently for forms in the *D. elatum* group.

Requienii. Erect, to 20 in., nearly simple: lower lvs. 5-parted, upper 3-parted, the segms. oblong or linear: raceme loose, the bracts narrow-lanceolate or linear, peduncles pubescent and bracted at middle; fls. blue, the curved spur about equal to the ovate white-hairy sepals; upper petals pale yellowish usually with bluish tinge: follicles 3. Medit. region.—Sometimes regarded as form of *D. Staphisagria*, differing in longer spur and bracts on peduncles, and less stature.

scopulorum. A variable group as formerly defined; if the original New Mexican collection is taken as typical, the plant is a puberulent or glabrous simple-stemmed per. 1–2 ft. high: lvs. much cut into narrow acute segms.: fls. indigo-blue and rather large, the spur exceeding the sepals (about ½–¾ in. long): follicles 3, nearly glabrous.—Hybrids are reported between *D. scopulorum* and *D. cardinale*, but it is doubtful what the *scopulorum* parent may be. *D. scopulorum* var. *subalpinum* is now known as *D. Barbeyi.*

simplex. Erect and simple, mostly tall, to 3 ft., pubescent: lvs. divided into linear parts: infl. spike-like and narrow; fls. blue, pubescent outside, sepals obtuse, spur reflexed at tip; upper petals with brownish-white apex: follicles 3, pubescent. Wyo., Ore., Wash.—Seldom cult.

sinense (*chinense*): *D. grandiflorum.*

speciosum. This name when applied to garden larkspurs is likely to indicate one of the showy (as the name implies) forms of the *cheilanthum-elatum* group. The true *D. speciosum* of the Caucasus region and beyond is probably not in garden cult.; it is a simple-stemmed plant 4–24 in. high, fls. blue, the sepals pubescent both sides and ½–¾ in. long and spur of equal length, petals dark purple: seeds scaly.

Staphisagria. Tall stout bien. to 3 ft. or more, soft-hairy, st. thick: lvs. 5–7-palmatifid. the segms. broad-lanceolate and acute: raceme many-fld., simple or branched at base, bracts at base of peduncles, the upper ones linear; fls. blue, often greenish-striped, sometimes pale or white, the obtuse spur much shorter than sepals; upper petals whitish and prominent: follicles 3, swollen. S. Eu., Medit. region.—Seldom cult.

subalpinum: *D. Barbeyi.*

sulphureum: *D. Zalil.*

superbissimum: hort. name.

taitsiense. Erect branching hispid per., 1½ ft. or more tall: lvs. divided into long-oblong acute parts or the upper ones linear: infl. many-fld. and corymbose; fls. violet-blue, spur very slender and 1 in. long and much exceeding sepals; petals dull yellow, the lower ones yellow-barbate: follicles 3, hairy. China.

Thunbergii: hort. name, perhaps for a form of *D. grandiflorum.*

tricorne. Soft-stemmed simple per., 1–3 ft., roots a tuberous cluster: lvs. with many lobes nearly linear to lance-oblong: fls. blue, lilac, lavender to white, prominently pedicelled in a terminal raceme, 1–1½ in. across, spur about equalling sepals: follicles 3, light-pubescent to glabrous. Pa. to Minn., Ark., Ga.—A semi-succulent species sometimes planted for early spring bloom; often called "staggerweed."

triste. To 2 ft.: lvs. 3–5-parted: fls. dark brown tinted red, in loose racemes. Siberia.

trolliifolium. Weak-stemmed, often reclining per. 2–6 ft.: lvs. parted into cuneate divisions that are cut into narrow acute lobes: fls. blue, racemose, sepals and spur ¾ in. long; upper petals white: follicles glabrous. N. Calif. and north.—Occasionally planted; known as "cow poison" and "poison larkspur."

variegatum. Royal L. Root tuberous: st. simple or branched, to 18 in.: lvs. much parted or divided into oblong mostly obtuse segms., with spreading hairs: fls. royal purple varying to lavender, in a few-fld. loose raceme. Coast ranges, Calif.

villosum. Tall erect per.: lvs. 3–7-parted, the segms. lanceolate-acute: raceme loose, the main bracts oblong or linear; fls. blue, the spur about equalling the sepals; petals brownish-purple: follicles pubescent or hairy. Turkestan, Russia.—Variable.

vimineum (*D. carolinianum* var. *vimineum*). Differs from *D. carolinianum* in having prominently scaly not winged seeds: lvs. broader: plant 2–4 ft., more or less branched: fls. blue, violet or whitish. Prairies, Tex.

virescens (*D. albescens*). Has been combined with *D. carolinianum*, but differs in the white or bluish-white fls., upper lvs. with oblong segms. N. C. west and southwest.

Walkeri: *D. cashmerianum* var.

yunnanense. Erect per., 2–3 ft.: lvs. with cuneate oblong-ovate incised lobes: fls. deep blue, spur slender and exceeding sepals (¾ in. long); upper petals light brownish, lower ones blue: follicles 3, glabrous. China, Tibet.—Little grown.

Zalil (*D. sulphureum*). Yellow L. St. simple or nearly so, 1–2 ft., root tuberous: lvs .with stiffish linear segms.: fls. yellow, sepals less than ½ in. long and about equalled by the straight spur. Persia.

DELTOID: triangular; delta-like.

DEMAZERIA (erroneously spelled *Desmazeria*). *Gramineæ*. Ann. and per. grasses with flattened many-fld. spikelets borne in spikes; one is sometimes grown for ornament. See *Grasses*.

sicula (*Brizopyrum siculum*). SPIKE-GRASS. Ann. to 1 ft.: lvs. to 6 in. long and ⅛ in. wide: spikelets to ½ in. long, in spikes 2–3 in. long. Medit. region.

DENDRIUM: *Leiophyllum*.

DENDROBIUM. *Orchidaceæ*. Epiphytes of various habit and leaf form, the fls. in racemes or sometimes solitary, dorsal sepal and petals similar, lateral sepals forming a sac or spur, lip entire or 3-lobed; popular greenhouse orchids. For cult. see *Orchids*.

acuminatum (*Sarcopodium acuminatum*). Pseudobulbs about 2 in. high, bearing 2 lvs. to 1 ft. long: fls. dark purple-red, 2½ in. across, in loose 10–30-fld. racemes, the lip 3-lobed, May–June. Philippines.

aggregatum. Pseudobulbs to 3 in. high, with 1 lf. about 2 in. long: fls. golden-yellow with orange-yellow throat, about 1 in. across, in 5–15-fld. lateral racemes, Mar.–May. Burma, China.

Ainsworthii. Hybrid between *D. nobile* and *D. aureum* (*heterocarpum?*).

albo-sanguineum. To 1 ft., leafless at flowering time: lvs. to 6 in. long: fls. white, with 2 red spots in throat, 2 in. long, in 2–3-fld. lateral racemes, May–June. Burma.

amplum (*Sarcopodium amplum*). Pseudobulbs to 2 in. long: lvs. to 6 in. long and 2 in. broad: fls. greenish-white suffused with purple, in few-fld. racemes. Trop. Himalayas.

anceps. Sts. to 16 in. long, thickly covered with 3-cornered lvs. to 3 in. long: fls. greenish-yellow, the lip edged with purple, in lateral and terminal clusters, May–Oct. Himalayas.

atroviolaceum. To 14 in., the pseudobulbs with 2 lvs. to 6 in. long: fls. whitish-yellow spotted with violet with dark violet lip marked with green, 2 in. across, in 10–20-fld. racemes to 8 in. high, Apr.–May. New Guinea.

aurantiacum. To 20 in. high: lvs. to 4 in. long: fls. golden-yellow, drooping, 2 in. across, in 2–3-fld. racemes, May–June. Burma.

aureum: *D. heterocarpum*.

barbatulum. St. to 1½ ft. long: lvs. to 3 in. long: fls. whitish, about ½ in. across, in dense 8–15-fld. racemes, Mar.–Apr. Indo-China.

bellatulum. St. about 2 in. high: lvs. to 2 in. long: fls. white with a purple-red lip, Apr.–May. Indo-China.

Bensoniæ. To about 3 ft. high, leafless at flowering: fls. white, the yellow lip orange-yellow at base and with purple spots in throat, 2 in. across, mostly 2 together, Mar.–Apr. Siam, Burma.

bigibbum. Pseudobulbs to 1½ ft. long: lvs. leathery, to 2 in. long: fls. purple-red, 2 in. across, in 4–10-fld. racemes to 1 ft. long, lip 3-lobed, Feb.–Mar. Australia.

Bronckartii. Pseudobulbs to 3 ft. long: fls. pale rose with orange spot on lip, 2 in. across, in many-fld. pendulous racemes. Cochin-China.

Brymerianum. Sts. to 2 ft. long: lvs. to 5 in. long: fls. golden-yellow, 2½ in. across, in 3–5-fld. lateral racemes, the lip fringed, Feb.–May. Burma.

bufordiense: *D. dulce*.

Calceolaria: *D. moschatum* var.

Cambridgeanum: *D. ochreatum*.

cariniferum. Pseudobulbs to 10 in. long: fls. 1½ in. across, with white sepals and petals and red-orange lip tipped with white or pale orange, long-spurred. Burma.

chlorostele (*D. xanthocentron*). Hybrid between *D. Linawianum* and *D. Wardianum*.

chrysanthum (*D. Paxtoni*). Sts. to 5 ft. long, leafless when flowering: lvs. to 6 in. long: fls. golden-yellow with 2 dark brown spots on throat, 1½ in. across, 2–3 together, the lip toothed, Mar.–Sept. Himalayas.

chrysodiscus: *D. melanodiscus*.

chrysotoxum. Pseudobulbs to 5 in. long, with 2 lvs. to 4 in. long: fls. golden-yellow with dark brown throat, 2 in. across, in 8–15-fld. pendulous racemes to 10 in. long, the lip fringed, Nov.–Apr. Burma, China. Var. **suavissimum** (*D. suavissimum*) has large chestnut spot on lip.

ciliatum. Sts. to 1½ ft. high: lvs. to 5 in. long: fls. in 5–15-fld. racemes to 10 in. long; sepals and petals greenish-yellow; lip 3-lobed, yellow veined with red, the middle lobe fringed, Oct.–Nov. Burma.

Cœlogyne (*Sarcopodium Cœlogyne*). Pseudobulbs 2 in. high, with 2 leathery lvs. to 4 in. long: fls. solitary, terminal, about 2 in. across, the sepals and petals brownish-yellow, lip dark purple, Oct.–Nov. Burma.

crassinode: *D. pendulum*.

crepidatum. Sts. to 10 in. long: lvs. to 4 in. long: fls. rose with center of lip golden-yellow, about 1 in. across, in 2's, Apr.–May. Himalayas.

crystallinum. Sts. about 1 ft. long, leafless when flowering: lvs. to 6 in. long: fls. white tipped with rose, the lip orange-yellow at base, 2 in. across, usually solitary, May–June. Himalayas.

cupreum: *D. moschatum* var.

Curtisi. Hybrid between *D. Cassiope* and *D. aureum* (*heterocarpum?*).

Dalhousieanum: *D. pulchellum*.

Dearei. Sts. to 2 ft. high: lvs. about 2 in. long: fls. white with green in center of lip, to 2½ in. across, in 3–6-fld. terminal racemes, Apr.–June. Philippine Isls.

densiflorum. Pseudobulbs to 16 in. high, with 3–5 leathery lvs. about 6 in. long: fls. golden-yellow or white with orange-yellow lip, about 2 in. across, in dense many-fld. pendulous racemes to 10 in. long, Mar.–May. Himalayas.

Devonianum. Sts. to 3½ ft. long: lvs. to 4 in. long: fls. white tipped with rose, the fringed lip with 2 large orange-yellow spots, 2 in. across, usually solitary on leafless sts., May–June. Himalayas.

dixanthum. Pseudobulbs to 3 ft. high: fls. yellow with orange spot on lip, in 2–6-fld. racemes. Burma.

draconis. Sts. to 14 in. high: lvs. 3 in. long: fls. white with 3 golden-yellow ridges on lip, about 1½ in. across, in 2–4-fld. terminal racemes, May–July. Burma, Cochin-China.

dulce (*D. bufordiense*). Hybrid between *D. aureum* and *D. Linawianum*.

endocharis. Hybrid between *D. aureum* and *D. moniliforme* (the latter being *D. Linawianum*).

eriæflorum. Sts. to 8 in. long: lvs. linear-lanceolate: fls. usually white veined with red, in many-fld. racemes. Himalayas.

euosmum. Hybrid between *D. nobile* and *D. endocharis*.

Falconeri. Pseudobulbs to 1½ ft. long: lvs. to 6 in. long: fls. white tipped with violet, the lip orange-red in center and with dark purple throat, about 3 in. across, usually solitary on leafless sts., May–June. Burma.

Farmeri. Pseudobulbs to 1½ ft. high: fls. about 2 in. across, in many-fld. pendulous racemes; sepals and petals white tipped with rose; lip golden-yellow tipped with rose, Apr.–May. Himalayas.

fimbriatum. St. to 5 ft. high: lvs. to 6 in. long: fls. deep yellow, 2 in. across, in 8–15-fld. pendulous racemes to 10 in. long, the lip fringed, Mar.–May. Himalayas. Var. **oculatum** has 2 dark brown spots in throat.

Findlayanum. Sts. to 1 ft. long: lvs. 3 in. long: fls. about 3 in. across, usually 2 together on leafless sts.; sepals and petals white tinged with rose near tip; lip yellow, pale rose near edges, Feb.–Mar. Burma.

formosum. Sts. to 1½ ft. high: lvs. to 4 in. long: fls. snow-white with center of lip orange-yellow, to 4 in. across, in 2–4-fld. clusters near top of st., Feb.–May. Himalayas. Var. **giganteum** has fls. to 5 in. across.

Goldiei: *D. superbiens*.

heterocarpum (*D. aureum*). Sts. to 16 in. long: lvs. 6 in. long: fls. to 2½ in. across, usually in 2's; sepals and petals cream-colored; lip yellow marked with orange-brown, May–June. Himalayas to Philippines.

Hillii. Pseudobulbs to 1 ft. long, with 3–4 lvs. to 10 in. long: fls. pure white with red-spotted lip, in pendulous racemes, Mar.–May. Australia.

infundibulum. Pseudobulbs to 2 ft. long: fls. snow-white with orange-yellow spot on lip, about 3 in. across, May–June. Burma. Var. **Jamesianum** (*D. Jamesianum*) has lateral lobes of lip roughened and throat cinnabar.

Jamesianum: *D. infundibulum* var.

Kingianum. Pseudobulbs about 6 in. long, with 2 lvs. to 6 in. long: fls. rose or rarely white, the 3-lobed lip marked with greenish-yellow, in 3–8-fld. racemes, Apr.–May, Australia.

Linawianum. Pseudobulbs to 1½ ft. long: fls. in 2's or 3's, about 2 in. across, rose-purple on upper part and white below, the lip obscurely 3-lobed. China, Japan.

lituiflorum. Sts. to 2 ft. long: lvs. to 4 in. long: fls. 2 in. across, in 2's on leafless sts.; sepals and petals violet-red, lip whitish tipped with violet and with 2 purple spots on throat, curved like a trumpet, Apr.–May. Burma.

macrophyllum. Pseudobulbs to 1 ft. high, with 2–3 lvs. to 8 in. long: fls. about 2 in. across, in 4–10-fld. racemes to 8 in. long; sepals greenish-white; petals white with band spotted violet-brown; lip 3-lobed, white marked with violet-brown, Apr.–June. Java, Moluccas.

melanodiscus (*D. chrysodiscus*). Hybrid between *D. Findlayanum* and *D. Ainsworthii.*

micans. Hybrid between *D. Wardianum* and *D. lituiflorum.*

moschatum. St. to 6 ft. high: lvs. to 6 in. long: fls. reddish-yellow with 2 red-brown spots in throat, about 2½ in. across. in 10–15-fld. racemes to 8 in. long, May–June. Himalayas. Var. **Calceolaria** (*D. Calceolaria*) has smaller orange-yellow fls. Var. **cupreum** (*D. cupreum*) has copper-colored fls.

nobile. Sts. to 1½ ft. high: lvs. to 4 in. long: fls. to 3 in. across, in 2's; sepals and petals rosy-purple; lip white edged and tipped with rose and with dark purple throat, Mar.–June. Himalayas. Runs into various color forms, such as: **album** with pure white fls.; **Amesiæ** with large pure white fls.; **Ashworthianum** with pure white fls. except the green mouth of lip; **Cooksonianum** with petals colored like the lip; **murrhiniacum,** fls. white tinged with violet, the throat deeper; **nobilius** with larger deeper colored fls.; **Oweniianum; Rothwellianum; summitense; virginale** with pure white fls. slightly tinged with primrose on lip.

ochreatum (*D. Cambridgeanum*). Pseudobulbs to 10 in. long: fls. golden-yellow with crimson throat, 2 in. across, in 2's, Mar.–Apr. Himalayas.

Parishii. Sts. to 1 ft. long: lvs. to 4 in. long: fls. rose with dark purple throat, about 2 in. across, in 2's, May-June. Burma.

Paxtoni: *D. chrysanthum.*

pendulum (*D. crassinode*). Sts. to 2 ft. long: lvs. to 5 in. long: fls. white tipped with purple, the throat yellow, to 2½ in. across, 1–3 together. Burma.

Phalænopsis. Sts. 2 ft. or more high: fls. rose with dark purple throat, 3 in. across, in 4–12-fld. racemes to 2 ft. long, Jan.–May. Australia to New Guinea. Var. **Schroederianum** has white sepals and petals. Var. **Statterianum** has deep violet fls.

Pierardi. Sts. to 3 ft. long: lvs. to 4 in. long: fls. 2 in. across, in 2–3-fld. racemes; sepals and petals bright rose; lip yellow marked with red, Apr.–May. Himalayas. Var. **latifolium** has broader lvs.

Pitcherianum (*D. Rolfeæ*). Hybrid between *D. nobile* and *D. primulinum.*

platycaulon. Pseudobulbs 7 in. long, with 3–5 lvs. to 3½ in. long: fls. straw-colored, in short 3–6-fld. racemes. Philippine Isls.

primulinum. Sts. to 16 in. long: lvs. to 4 in. long: fls. to 3 in. across, solitary on leafless sts.; sepals and petals whitish tinged with yellowish-red; lip primrose-yellow with purple striped throat, Apr.–May. Himalayas.

pulchellum (*D. Dalhousieanum*). Sts. to 4 ft. long: fls. brownish-yellow with large dark purple spot in throat, 3 in. across, in 6–10-fld. pendulous racemes, Apr.–May. Himalayas.

ramosum. Pseudobulbs slender, to 1½ ft. tall: fls. solitary or in 2's, pale primrose-yellow; lip 3-lobed, the lateral lobes white and streaked. Himalayas.

regium. Sts. to 16 in. high: lvs. to 4 in. long: fls. about 3 in. across, in 2's; sepals and petals rose, white at base; lip rose edged with white and with golden throat, July. India.

Roeblingianum. Hybrid between *D. nobile* and *D. Ruckeri* (the latter being *D. ramosum*).

Rolfeæ: *D. Pitcherianum.*

rubens. Hybrid between *D. Ainsworthii* and *D. nobile.*

Sanderæ. Very similar to *D. Dearei* but with larger fls. having a reddish throat, Oct.–Dec. Philippine Isls.

Schneiderianum. Hybrid between *D. Findlayanum* and *D. aureum.*

secundum. Sts. 3 ft. high: lvs. to 4 in. long: fls. rose with orange-yellow disk, in many-fld. one-sided racemes, Apr.–June. Sumatra, Philippine Isls.

speciosum. Pseudobulbs to 1 ft. long, with 3–4 lvs. to 10 in. long: fls. yellow with white lip spotted red, in many-fld. racemes to 16 in. long, Feb.–Apr. Australia.

suavissimum: *D. chrysotoxum* var.

superbiens (*D. Goldiei*). Pseudobulbs to 2½ ft. high: fls. crimson-purple, with white ridges on lip, about 2 in. across, in nodding terminal racemes, Mar.–May. Australia.

superbum. Pseudobulbs to 4 ft. long: fls. rose-purple with 2 dark purple spots in throat, to 4 in. across, in 2's, Feb.–Apr. Borneo to Philippines.

Thwaitesæ. Cross between the hybrids *D. Ainsworthii* and *D. Wiganiæ.*

thyrsiflorum. Perhaps only a form of *D. densiflorum* with longer sts. and white sepals and petals. Himalayas.

undulatum. Fls. 2 in. across, yellowish-brown with whitish lip, the sepals and petals twisted, Apr.–May. Australia.

Veitchii. Hybrid between *D. moniliforme* and *D. Wardianum.*

Wardianum. Sts. to 2½ ft. long: lvs. 3 in. long: fls. white tipped with rose-purple, the lip with yellow throat with 2 dark purple spots, to 4 in. across, in 2's on leafless sts., Apr.–June. Burma.

Wiganiæ. Hybrid between *D. nobile* and *D. signatum* (the latter being *D. Bensoniæ*).

xanthocentron: *D. chlorostele.*

DENDROCALAMUS. GIANT BAMBOO. *Gramineæ.* Tree-like bamboos of S. Asia and Malaya, the spikelets borne in globose clusters or heads in long panicles, stamens 6. See *Bamboo.*

Hamiltonii. To 80 ft.: lvs. to 15 in. long and 2½ in. wide, rough on edges: heads many-fld., to 1½ in. across, in branching panicles. Himalayas.

latiflorus. Tall: lvs. to 10 in. long and 2 in. wide: heads few-fld., about ¾ in. across. India, Cochin-China.

membranaceus. To 80 ft.: lvs. to 10 in. long and ¾ in. wide: heads many-fld., 1 in. across. India.

strictus. MALE BAMBOO. To 50 ft., sts. becoming yellowish: lvs. to 1 ft. long and 1½ in. wide: heads many-fld., 1½ in. across. India, Java.

DENDROCHILUM (*Platyclinis*). *Orchidaceæ.* Epiphytes with small pseudobulbs bearing 1 narrow evergreen lf. and small fls. in long pendulous racemes, sepals and petals similar, the lip 3-lobed; warmhouse plants. For cult. see *Orchids.*

Cobbianum. To 1 ft.: fls. white with yellow lip, about ½ in. across, in long-stalked racemes, Mar.–Oct. Philippines.

cucumerinum. Lvs. to 5 in. long and ½ in. wide: fls. green and transparent. Philippines.

filiforme. Lvs. to 8 in. long: fls, yellowish-white with yellow lip, about ¼ in. across, in long-stalked racemes to 2 ft. long, May–June. Philippines.

glumaceum. Fls. white with greenish-yellow lip, about ½ in. across, in long-stalked racemes, Mar.–Apr. Philippines. Var. **superbum** has larger spikes.

latifolium. Lvs. to 10 in. long: fls. yellow-green, about ½ in. across, in long-stalked racemes, Mar.–Apr. Philippines.

DENDROMECON. *Papaveraceæ.* One Californian glabrous evergreen shrub planted for ornament in warm climates. Propagated by seeds which are very slow in germinating. **D. rigida.** Bush-Poppy. Tree-Poppy. To 10 ft.: lvs. leathery with prominent veins, lanceolate to ovate-lanceolate: fls. golden-yellow, 2 in. across: fr. linear, to 4 in. long.

DENDROPANAX: *Gilibertia japonica.*

DENDROPOGON: *Tillandsia usneoides.*

DENEA: *Howea Forsteriana.*

DENNSTAEDTIA. Cup-Fern. *Polypodiaceæ.* Large or medium-sized ferns with 1–3-pinnate lvs., hairy creeping rhizomes and marginal sori; native in the tropics and subtropics, one in N. N. Amer. Of easy cult.; see *Ferns.*

adiantoides. Glossy C. Lvs. to 4 ft. long and 3 ft. wide, 3-pinnate, glabrous and shining, on bright brown stipes to 3 ft. long. W. Indies, N. S. Amer.

cicutaria (*Dicksonia cicutaria. Sitolobium cicutarium*). Common C. Lvs. to 6 ft. long and 3 ft. wide, 4-pinnate, shining and glabrous, on yellowish-brown stalks to 3 ft. long. W. Indies, N. S. Amer.

punctilobula (*Dicksonia pilosiuscula* and *punctilobula*). Hay-scented-Fern. Hardy: lvs. to 3 ft. long and 9 in. wide, 3-pinnate, pubescent beneath. N. B. to Ga. and Ala.—Sometimes planted in the wild-garden.

DENTARIA. Toothwort. *Cruciferæ.* Little spring-blooming woods herbs of the northern hemisphere, useful in the wild-garden, rock-garden, and for colonizing: per., with toothed or scaly rootstocks, and few divided or compound lvs. high on st., the radical lvs. often of different character: fls. white, rose or purple, in terminal corymb-like racemes: fr. or silique elongated and beaked.

diphylla. Erect, 6–12 in. from a long continuous rootstock: st.-lvs. mostly 2 and opposite, ternate, the divisions or lfts. ovate and toothed or shallowly lobed: fls. white, in a glabrous cluster. N.S. to Minn. and S. C.

laciniata. To 1 ft. or so from a jointed rootstock: st.-lvs. commonly 3, approximately verticillate, the divisions very narrow: fls. white or purplish, in a somewhat pubescent cluster. Que. to Minn. and Fla.

DENTATE: with sharp spreading rather coarse indentations or teeth.

DERRIS (*Deguelia*). *Leguminosæ.* Trop. woody climbers with alternate pinnate lvs., papilionaceous purple or white fls. in racemes, panicles or clusters, and flattened pods; sometimes planted out-of-doors in warm regions.

scandens (*D. timorensis*). Malay Jewel Vine. Lvs. of 9–18 oblong lfts. to 2 in. long: fls. pale rose, in axillary racemes often twice as long as lvs.: pods to 3 in. long. Malaya, China, Australia.

timorensis: *D. scandens.*

DESCHAMPSIA: *Aira.*

DESERT-CANDLE: *Eremurus.*

DESFONTAINEA. *Loganiaceæ.* One glabrous little shrub in the Andean regions of S. Amer., intro. in Calif. **D. spinosa.** To 3 ft., with opposite coriaceous spiny-tooth holly-like elliptic-oblong lvs.: fls. tubular, scarlet and yellow, terminal, with 5-lobed somewhat trumpet-shaped corolla, and 5 stamens: fr. a globose or ovoid berry.

DESMANTHUS (*Acuan*). *Leguminosæ.* American per. herbs or sometimes shrubs with bipinnate mimosa-like lvs. and small regular greenish or whitish fls. in heads or spikes; one species is rarely offered.

brachylobus: *D. illinoensis.*

illinoensis (*D. brachylobus*). To 3 ft.: lfts. numerous and very small: pods in dense heads, oblong, to 1 in. long, curved. Ohio to Fla. and New Mex.

DESMAZERIA: *Demazeria.*

DESMODIUM (*Meibomia*). Tick Trefoil. Tick Clover. *Leguminosæ.* Herbs, often woody at base, with lvs. mostly of 3 lfts., small papilionaceous fls. in racemes or panicles, and flat pods consisting of several joints which separate readily and often adhere to clothing like burs. They are sometimes transferred to borders and the wild-garden. Natives in dry woods and fields.

bicolor: *Lespedeza bicolor.*

canadense. Per. to 8 ft.: lfts. oblong or oblong-lanceolate: fls. purple, to ¾ in long: pods 1 in. long, 3–5-jointed. N. S. to N. C. and Okla.

ciliatum: *Rhynchosia puberula.*

cinerascens. Procumbent per., sts. to 4 ft. long, gray-pubescent: lfts. elliptic-oblong: fls. purple, about ½ in. long: pods 6–8-jointed. Mex.

Dillenii. Per. to 3 ft.: lfts. oval to oblong-ovate: fls. purple, ¼ in. long: pods to 1 in. long, 2–4-jointed. Ont. to Fla. and Tex.

floribundum (*D. sambuense*). Sts. woody: lfts. obovate-oblong: fls. purple, ½ in. long: pods to 1 in. long, 6–8-jointed. Himalayas.

gyrans (*Codariocalyx gyrans*). Telegraph-Plant. Per. to 4 ft.: terminal lft. oblong, the lateral ones very small and moving in all directions: fls. purple or violet, ¼ in. long: pods to 1½ in. long, 6–10-jointed. Trop. Asia.—Grown as a curiosity in greenhouse. Treated as an ann. Propagated by seeds.

japonicum: *Lespedeza japonica.*

marylandicum. Per. to 3 ft.: lfts. ovate or orbicular: fls. purplish, ⅙ in. long: pods very small, 1–3-jointed. Ont. to Fla. and Tex.

nutans. Perhaps a synonym of *D. tiliæfolium* but lvs. and pods more pubescent.

penduliflorum: *Lespedeza formosa.*

purpureum (*D. tortuosum*). Beggarweed. Per., but grown as ann., to 8 ft.: lfts. ovate or oblong: fls. blue or purple, ⅙ in. long: pods to 1 in. long, twisted, 2–6-jointed. W. Indies.—Grown in S. U. S. as a forage and cover-crop. Seeds should be sown on rather moist land, in spring. No care will be needed after first year as it will reseed itself.

sambuense: *D. floribundum.*

tiliæfolium. Sts. woody: lfts. obovate: fls. purple, ½ in. long: pods to 3 in. long, 6–9-jointed. Himalayas.

tortuosum: *D. purpureum.*

DESMONCUS. *Palmaceæ.* Monœcious slender gregarious very spiny feather-palms climbing or clambering by means of the prolonged lf.-rachis, otherwise considerably like Bactris, in trop. Amer.; sparingly tried in Fla. and probably under glass. See *Palm.*

major. St. very long, climbing: pinnæ 20 pairs, more or less clustered, linear, acuminate, rachis dark-tomentose and spiny: spathe brown-prickly. Trinidad.

oxyacanthos. Nearly erect or straggling at apex: pinnæ about 6 in. long, alternate or subopposite, 2 in. or less broad, rachis somewhat tomentose or spotted, spiny: spathe nearly or quite glabrous. Brazil.

DESMOTHAMNUS: *Lyonia lucida.*

DETARIUM. *Leguminosæ.* Trop. African trees with pinnate lvs., small fragrant white fls. without petals borne in panicles, and pod round and indehiscent resembling a drupe; one species has been intro. into S. Fla. for ornament and interest.

senegalense. Lfts. 6–12 or more, ovate-oblong, to 3 in. long: panicles to 6 in. long: pods to 2½ in. across.

DEUTZIA. *Saxifragaceæ.* Attractive and popular floriferous shrubs with opposite usually deciduous serrate lvs. and white, blush or purplish fls. mostly in panicles and racemes in early summer; native in E. Asia and the Himalaya region. Most of them are hardy N.

Deutzias thrive in any well-drained soil. Potted plants may be forced in a temperature of not over 50° for conservatory and greenhouse decoration, but they cannot be forced again. They are propagated by both greenwood and hardwood cuttings, also by divisions, layers, and by seeds sown in boxes or pans in spring.

candelabrum. Hybrid between *D. gracilis* and *D. Sieboldiana,* having ovate-lanceolate lvs. and fls. in panicles.

candidissima: *D. scabra* var.

corymbiflora: *D. setchuenensis* var.

crenata: *D. scabra.*

discolor. To 6 ft.: lvs. oblong-lanceolate, to 4 in. long, densely hairy beneath: fls. white, ¾ in. across, in many-fld. corymbs. Cent. China. Var. **major** has fls. about 1 in. across, rosy outside.

elegantissima (*D. discolor* var. *elegantissima*). Hybrid between *D. purpurascens* and *D. Sieboldiana:* lvs. ovate or oblong-ovate, pubescent beneath: fls. pink, ¾ in. across, in loose corymbs.

excellens (*D. discolor* var. *excellens*). Hybrid between *D. Vilmorinæ* and *D. rosea* var. *grandiflora:* lvs. ovate-oblong, to 4 in. long, gray-pubescent beneath: fls. ¾ in. across, in loose corymbs.

Fortunei: *D. scabra* var.

globosa. Resembling *D. discolor* but with smaller lvs. and fls. which are creamy-white. Cent. China.

gracilis. To 6 ft., branches slender, wide spreading or arching: lvs. lanceolate, to 2½ in. long, nearly glabrous beneath: fls. pure white, ¾ in. long, in open simple or compound racemes. Japan. Var. **aurea** has yellow lvs.

grandiflora. To 6 ft.: lvs. ovate, to 2 in. long, white-tomentose beneath: fls. white, 1–3 together, 1 in. and more across, Apr.–May. N. China.

hypoglauca. To 6 ft.: lvs. ovate-oblong to oblong-lanceolate, to 3½ in. long, glabrous and glaucous beneath: fls. white, to ¾ in. across, in many-fld. corymbs. Cent. China.

kalmiæflora. Hybrid between *D. purpurascens* and *D. parviflora:* lvs. ovate-oblong, to 2 in. long, slightly hairy beneath: fls. white with outside carmine, ¾ in. across, in loose corymbs.

Lemoinei. Hybrid between *D. gracilis* and *D. parviflora:* lvs. elliptic-lanceolate, to 4 in. long: fls. pure white, ¾ in. across, in large corymbs or broad panicles. Var. **compacta** is a dwarf form with smaller fls.

longifolia. To 6 ft.: lvs. lanceolate, to 5 in. long, pale and densely hairy beneath: fls. light purple, to 1 in. across, in many-fld. corymbs. W. China.

macrothyrsa: listed name.

magnifica. Hybrid between *D. scabra* and *D. Vilmorinæ:* lvs. ovate-oblong, to 3 in. long, tomentose and grayish-green below: fls. double, white, in short panicles. Var. **eburnea** has campanulate fls.

Moubergi: listed name.

myriantha. Hybrid between *D. parviflora* and *D. setchuenensis:* lvs. oblong-ovate to -lanceolate, to 3½ in. long, hairy beneath: fls. white, ¾ in. across, in loose corymbs.

parviflora. To 6 ft.: lvs. ovate to ovate-lanceolate, to 4 in. long, somewhat hairy: fls. white, about ½ in. across, in many-fld. corymbs. N. China.

purpurascens. To 6 ft., slender curving branches: lvs. oblong-ovate to -lanceolate, to 2½ in. long, pubescent beneath: fls. white inside, purplish outside, ¾ in. across, in 4–10-fld. corymbs. W. China.

reflexa. Similar to *D. discolor* but with simple hairs and smaller fls. Cent. China.

rosea. Hybrid between *D. gracilis* and *D. purpurascens:* lvs. ovate-oblong to -lanceolate, slightly hairy: fls. pinkish outside, ¾ in. across, in short panicles. Var. **campanulata,** fls. white, 1 in. across; var. **carminea,** fls. purplish outside; var. **eximia,** fls. only slightly pinkish outside; var. **floribunda,** infl. dense; var. **grandiflora,** infl. less dense; var. **multiflora,** fls. white; var. **venusta,** fls. white.

scabra (*D. crenata*). To 7 ft.: lvs. oblong-lanceolate to ovate, to 3 in. long, pubescent on both sides: fls. white or blush, to ¾ in. long, in narrow erect panicles. Japan, China. In the trade are also offered the vars.: **candidissima** (*D. Wellsii*), fls. pure white, **Fortunei,** fls. larger; **plena,** fls. double, white tinged with rose outside; **Pride of Rochester,** very large fls. faintly tinted with rose outside; **Watereri,** fls. white tinted carmine outside.

Schneideriana. To 6 ft.: lvs. elliptic-ovate, to 2½ in. long, grayish-tomentose beneath: fls. white, in broad loose panicles. Cent. China. Var. **laxiflora** has narrower lvs. and broader panicles.

setchuenensis. To 6 ft.: lvs. lanceolate, to 3 in. long, densely pubescent beneath: fls. white, ½ in. or less across, in loose corymbs. China. Var. **corymbiflora** (*D. corymbiflora*) has larger lvs. and fls.

Sieboldiana. To 6 ft.: lvs. ovate, to 3 in. long, pubescent beneath: fls. white, ½ in. across, in loose panicles. Japan.

taiwanensis. Lvs. lanceolate or elliptic, to 5 in. long, hairy on both sides: fls. resembling *D. Sieboldiana.* Formosa.

Vilmorinæ. To 6 ft.: lvs. oblong-lanceolate, to 3½ in. long, densely pubescent beneath: fls. white, to 1 in. across, in loose corymbs. China.

Watereri: *D. scabra* var.

Wellsii: *D. scabra* var. *candidissima.*

Wilsonii. Hybrid between *D. discolor* and *D. mollis:* lvs. oval to oblong-lanceolate, to 5 in. long, pubescent: fls. white, ¾ in. across, in loose corymbs.

DEVILS-CLUB: *Echinopanax horridum.*

DEVILS-PAINTBRUSH: *Hieracium aurantiacum.*

DEVILS-TONGUE: *Hydrosme Rivieri.*

DEVILS-WALKING-STICK: *Aralia spinosa.*

DEVIL-TREE: *Alstonia scholaris.*—Wood: *Osmanthus americanus.*

DEWBERRY. The dewberries of American gardens and plantations are forms of native species of running trailing blackberries that root at joints or tip; they are mostly *Rubus flagellaris.* Dewberries commonly mature fruit earlier in the season than the highbush or non-trailing blackberries, the difference amounting perhaps to one or two weeks.

The culture is like that of the blackberry, but support should be given to the canes, as they are very slender and rank growers. A wire trellis or large-meshed fence-wire answers admirably; or they may be tied to stakes. The fruits are large and showy, which, combined with their earliness, make them desirable; but they are usually deficient in flavor. The Lucretia is the leading variety. Lay the canes on the ground in winter in rigorous climates. In spring tie all the canes from each plant to a stake. After fruiting, cut the old canes and burn them (as for blackberries). In the meantime, the young canes (for next year's fruiting) are growing. These may be tied up as they grow, to be out of the way of the cultivator. See *Blackberry.*

DIACRIUM. *Orchidaceæ.* Trop. American epiphytes with pseudobulbs bearing a few lvs. and white fls. in racemes, the sepals and petals similar, the lip free and 3-lobed; often regarded as a section of Epidendrum. For cult. see *Orchids.*

bicornutum (*Epidendrum bicornutum*). Sts. to 8 in. long, with 4–5 lvs. to 8 in. long: fls. white finely spotted with red, about 2 in. across, in 5–20-fld. racemes to 1 ft. long, May–June. Trinidad, Guiana.

DIAMOND-FLOWER: *Ionopsidium.*

DIANELLA. *Liliaceæ.* Rhizomatous perennials with fibrous roots, grass-like sheathing lvs., blue or whitish fls. in loose panicles, the perianth-segms. distinct, and blue berries.

The plants succeed in a cool greenhouse or out-doors in mild climates. Propagated by division or seeds sown in spring with heat.

ensifolia (*Dracæna ensifolia*). To 6 ft.: lvs. to 1 ft. long and 1 in. wide: fls. blue or whitish, to ⅓ in. long. Asia, Australia, Hawaii.

intermedia. Rootstocks creeping, bearing the lvs. at top which are 3 ft. long and ¾ in. wide: fls. greenish- or purplish-white, about ⅓ in. across, in panicles to 2 ft. long. New Zeal.—*Mondo Jaburan* has been cult. under this name.

revoluta. To 3 ft.: lvs. in rosette, to 1½ ft. long and ⅓ in. across, purplish at edge and base. Australia, Tasmania.

DIANTHUS. Pink. *Caryophyllaceæ.* Per. and ann. herbs, mostly of the northern hemisphere of the Old World, grown for the ornamental and often fragrant bloom. They are mostly tufted or mat-forming evergreen plants, thriving best in the northern parts of the country; many of the smaller alpine and boreal species are attractive in the rock-garden. The fls. are prevailingly pink or rose, but they run also to red, white and even yellow. The ann. pinks (*D. chinensis*) of flower-gardens are really short-lived perennials that bloom the first year from seed. The carnation (*D. Caryophyllus*) is a subject of special cultivation: see *Carnation.* The "grass pinks" of yards and borders are mostly *D. plumarius* and derivatives. The familiar sweet william is *D. barbatus.*

Pinks are of simple cultivation. Many of them are spring-bloomers. Even the perennials should be renewed every two or three years either by division, cuttings, layers, or preferably by seeds when named varieties are not involved. Sowings in spring or summer should give good blooming plants the following year, and the second year of bloom is often the best. The perennial mat-forming kinds may be renewed by the cutting back in autumn of all the long growths; and the prompt plucking of flowers, removing the stems far down, is essential for best results. Consult the comments under some of the leading species; the plants are perennial unless otherwise stated.

acaulis: *D. frigidus*, which is *D. sylvestris* var.

acicularis. Cespitose, to 10 in. high, the sts. 4-angled and branched: lvs. long-linear and acute, less than 1 in. long: fls. rose or white, the petals digitate-multifid; bracts 4, short, appressed. Russia, Rumania.

Allwoodii. A class of hybrids between *D. plumarius* and *D. Caryophyllus* by Allwood Bros., England: per., hardy, in many colors, petals entire to variously fringed, mostly with firm broad more or less glaucous foliage and good tufted habit.—Named kinds or particular strains may be propagated any time in summer by means of cuttings and layers.

alpestris. Low alpine, to 8 or 9 in., with very short narrow lvs. overtopped by inodorous fls. that are solitary or paired and about 1 in. across: petals notched or somewhat fringed and deep pink or rose. Eu.

alpinus. Cespitose: lvs. dark green, the radical ones broad, short and obtuse: fls. to 1½ in. across, mostly solitary on sts. 2–4 in. high, inodorous, deep rose to purplish and crimson spotted and an eye; petals broad; handsome. Switzerland to Greece and Russia.

arenarius. Cespitose: sts. many, very slender, 6–15 in. tall, bearing several long-pedicelled white fls. with slender calyx and somewhat fragrant: petals finely cut beyond middle. Finland to Dalmatia.

Armeria. Weedy ann., nat. in old fields in this country, seldom cult.: sts. erect, forked, to 2 ft.: fls. rose or pink, many and small, in close heads with long pubescent bracts. Eu.

arvernensis. A name in the trade for a small cespitose plant with 2 or 3 pink fls. on sts. 2–4 in. high, petals denticulate: lvs. mostly basal, narrow, about ½ in. long. France; reported as a natural hybrid, of which *D. monspessulanus* is one parent.

asper: see *D. Seguieri.*

atrorubens. Sts. stiffly erect, to 2 ft. bearing at the top a close fl.-head 1 in. or more across furnished with long-pointed bracts: fls. dark red, small, the petals dentate and expanding flat in sun. S. and E. Eu.—By some writers treated as a form of *D. carthusianorum.*

Balbisii: plants listed under this name may be either *D. liburnicus* or a form of *D. carthusianorum.*

banaticus. Glaucous: sts .simple, 1 ft. high: fls. red, 10 or 12 of them in a head subtended by acuminate reddish dry bracts; petals obovate, bearded. S. E. Eu.—Plants grown under this name are likely to be forms of *D. carthusianorum.*

barbatus. Sweet William. Glabrous, to 2 ft.: lvs. green, broad and flat: fls. in large bracted heads, inodorous, red, purple, rose, white, particolored, in some forms double. Pyrenees to Russia and China; run wild in E. U. S.—There are named vars., as Newport Pink. It is per. but would better be treated as bien. for the improved kinds; the so-called ann. sweet williams bloom first year from seed.

brevicaulis. Compact cespitose glaucous plant with sts. about 1 in. high and surpassing the lvs.: fls. solitary, about ½ in. long; calyx reddish; petals purple, dentate. Mt. Taurus, Cilicia.

cæsius. Cheddar Pink. Mat-forming, glaucous: sts. simple or somewhat branched, 3 to 12 in.: lvs. short and narrow: fls. solitary or few on a st., showy, rose-color, fragrant; petals bearded and toothed. England to Germany and S. France.

callizonus. Glaucous and glabrous plant with 1-fld. terete sts. 4–14 in.: lvs. rather short and broad, spreading: fls. 1 in. across, the petals broad and contiguous, purple and spotted above, rose underneath, zoned in center, dentate; calyx-bracts 4, purplish, spreading. S. E. Eu.

calocephalus. Smooth and glaucous, to nearly 3 ft.: lvs. linear-acute, more or less recurved: fls. brick-red, in few-fld. heads. S. E. Eu., Asia Minor.

capitatus. Glaucous, pubescent or woolly: sts. simple, to 1 ft. or more: fls. small, 6–8 together in a mucronate-bracteate head; petals purple and spotted. Balkans to Siberia.—Likely to be confused in cult. with *D. carthusianorum.*

carthusianorum. Carthusian Pink. Widely variable cespitose glabrous green or seldom somewhat glaucous plant with 4-angled erect simple sts. to 20 in. high terminating in a dense few- or many-fld. head with mucronate or aristate bracts, the fls. small, inodorous, rose, purple or dark red. Denmark and the Urals to Portugal and Egypt.

Caryophyllus. Clove Pink. Carnation. Tufted glabrous and glaucous plant, 1–3 ft. high, of stiff habit: fls. solitary or few on a st., showy and very fragrant, 1 in. and more across, the petals not bearded and irregularly dentate. S. Eu. to India.—Under cult. has given rise to many sizes, colors, races and forms, the petals from entire to shallowly cut; colors pink, rose, purple, white, yellow, known in this country mostly as a glasshouse cut-flower, but there are hardy border and marguerite races; the picotee belongs here. See *Carnation.*

caucasicus: name of doubtful standing; plants so listed are at least sometimes *D. deltoides.*

chinensis (*D. sinensis*) Glabrous green tufted plant of rather strict habit, 12–18 in. high, sts. more or less branching: fls. solitary or loosely assembled, slightly if at all fragrant, lilac, red or white, to 1 in. across. Portugal to China and Japan.—Little cult. (if the European *D. Seguieri* is excluded). Var. **Heddewigii**, supposed derivative, comprises the hardy ann. pinks of gardens, blooming first year from seed although bien. to per.; lvs. broad, bracts under calyx spreading; fls. in many colors and markings and often of great size and petals much cut and frilled. *D. stellaris* is a form with narrow petals, sometimes almost linear.

ciliatus. Cespitose, glabrous, glaucous: st. simple, to 2 ft., branched above: fls. long-peduncled, rose-color, fragrant, petals dentate or entire. Austria, Italy to Egypt.

collinus. Glaucous, pubescent, 1–2 ft., slightly branched except near apex: lvs. many on the st., erect, rather broad, 1–2 in. long: fls. 3–5 together in an open fascicle, about ¾–1 in. across, deep pink or darker. Pyrenees to Asia Minor.

compactus. Glabrous, to about 20 in.: lvs. plane, lanceolate: fls. purple, scentless, in dense 3-forked fascicles. S. E. Eu.

connatus. Name of a mat-forming somewhat glaucous plant with short basal lvs. and simple or forked sts. 6 in. high: fls. white, 1 in. across, deeply fringed; calyx cylindric; bracts short, pointed. Cultigen?

corsicus. Name in the trade for a low matted green plant with abundant rather soft basal foliage: sts. 4–12 in., simple or forked: fls. blush, to 1 in. across, deeply sharp-dentate; bracts short, pointed.

crinitus. Sts. somewhat woody at base, erect, 4–18 in., often sparingly forked, sometimes pubescent: lvs. narrow, about 1 in. long: fls. solitary, white, slender-cylindrical, 1½–2 in. long; petals cut into hair-like divisions. Algeria to N. W. India.

croaticus. The plant grown under this name has small red or rose fls. in a compact head, after the manner of *D. carthusianorum.*

cruentus. Cespitose, glaucous: sts. to 18 in., forked, terete, terminating in a small head of blood-red fls.: petals dentate. E. Eu.—One of the *D. carthusianorum* group, to which the cult. plants may belong.

Cyri. Ann. but surviving the winter if sown in midsummer, much branched, to 2 ft.: fls. solitary but many, each subtended by long-pointed bracts exceeding the turbinate calyx, corolla ⅜ in. across, rose, dentate, opening in sun. S. W. Asia, Egypt.—Weedy.

delicatus: a form of *D. plumarius* or a derivative.

deltoides. MAIDEN PINK. Mat– or sod-forming, green, with radical lvs. and those on runners 1 in. or less long and obtuse, those on st. acute: fls. ¾ in. or less across, red or pink with crimson eye (a white-fld. form), borne on forks of sts. that rise 4–15 in. Great Britain to Japan; nat. in U. S.—Known also as *D. procumbens.* Var. **glaucus** has prominently glaucous foliage.

dentosus. Botanically a form or associate of *D. chinensis*, but the plant in cult. under this name may be different.

diadematus: *D. chinensis* var. *Heddewigii.*

diffusus. Glabrous: sts. 10 in. tall, with terete branches: radical lvs. obtuse: fls. 2 together and long-peduncled, rose and red, the petals slightly hairy; bracts 2, obovate and mucronate. Greece.

erythrocoleus. Cespitose, glabrous: sts. 1-fld., 2 in. high: lvs. about 2 in. long, acute: fls. rose, the petals fimbriate to about the middle; bracts 4, about ⅓ length of calyx. Armenia.—Plants grown under this name may be *D. deltoides.*

fimbriatus. Woody at base, glabrous: sts. simple, 1 ft.: lvs. acute and appressed: fls. rose-color, the petals deeply cut or fimbriate; bracts 4–12, ⅓ length of calyx, straw-colored. Portugal to Tibet.—Forms of *D. plumarius* are also grown under this name.

fragrans. Cespitose, glabrous: sts. to 1½ ft., with angled branches above: lvs. acuminate: fls. fragrant, rose-white and spotted; petals fimbriate, bracts 6–8, appressed. Caucasus.

Freynii: *D. glacialis* var.

frigidus: *D. sylvestris* var.

furcatus. Attractive cespitose glaucous plant with lvs. mostly basal: sts. mostly forked, to 9 in. high: fls. solitary, rose-color, inodorous, about ½ in. across; petals dentate, with reflexed margin. Alps in Italy.

gallicus. Plant pubescent, at least on radical lvs. (which are ciliate) and lower part of st., glaucous, to 1 ft. or more: fls. rose to white, fragrant, about 1 in. across, blade fimbriate or cut to ⅓ its depth; calyx-bracts 4, short, appressed. W. France.

Gardnerianus: *D. chinensis* var. *Heddewigii.*

gelidus. Cespitose and glabrous, the sts. to 3 or 4 in high, simple and 4-angled: fls. rose and spotted; calyx-bracts 6, acuminate and recurved. E. Eu.

giganteus. Cespitose, glabrous and glaucous, the sts. terete, stout and simple, to 2–3 ft. or more, terminated by dense 10–12-fld. head: fls. red; calyx purple and narrowed at top. E. Eu.—Plants grown under this name may be *D. carthusianorum.*

glacialis. Cespitose, glabrous, 3–4 in., the sts. simple, 4-angled, 1–2-fld.: radical lvs. obtuse: fls. ½ in. or more across, inodorous, reddish-purple; petals denticulate and yellowish underneath, contiguous or close together; calyx and 2–4 bracts reddish. Mts., S. Eu.—Other species are likely to be grown under this name. Var. **Freynii** (*D. Freynii*) has short soft lvs., sts. always 1-fld., calyx-teeth ciliate.

graniticus. Sts. 4–7 in., slender, 4-angled, bearing 1–3 fls.: lvs. very narrow, acute: fls. to 1 in. across; petals dentate, purple above but paler underneath; calyx purple. Pyrenees.—*D. deltoides*, a very different plant, has been grown under this name.

Grisebachii: *D. viscidus* var.

hæmatocalyx. Cespitose, to 9 in.: radical lvs. to 2 in. long, stiffish, with rough margins, very narrow (a var. with somewhat glaucous foliage): fls. 3–5 on forking sts., calyx red, petals purple and yellowish underneath. Greece.

Hartwegii: *D. chinensis* var. *Heddewigii.*

Hoeltzeri. Cespitose and low, with strict radical lvs.: fls. spotted rose or yellowish, more or less fringed, about 1½ in. diam. Turkestan.

hungaricus: name of doubtful application.

hybridus: hort. name applied in the *D. chinensis* group.

imperialis: *D. chinensis* var. *Heddewigii.*

inodorus: *D. chinensis* var. *Heddewigii;* also variously applied.

integer: synonym of *D. strictus.*

kamtchaticus: listed name.

Knappii. Erect to 16 in., scabrous, more or less glaucous, sts. simple and bearing a compact head at apex: fls. light yellow, not fragrant, ¾ in. across, with prominent acuminate calyx-bracts. Italy to Hungary.

laciniatus: *D. chinensis* var. *Heddewigii.*

latifolius. Stiff and erect, 10–16 in., roughish, branched above, green, bearing terminal 1–6-fld. bracted heads: lvs. short and broad, 2–3 in. long and to ⅝ in. wide: fls. rose to dark red, single or double. Cultigen; intermediate in character between *D. barbatus* and *D. chinensis* or *D. plumarius* and accounted a hybrid.

leptopetalus. Glabrous: sts. 2–3-fld., to 15 in.: lvs. long-linear and acuminate: petals yellowish-white above and bluish underneath, entire. Russia, Siberia.

Lereschei: a form of *D. alpestris* of low condensed habit and deeply dentate petals.

Liboschitzianus. Cespitose, glabrous: sts. to 8 in., 4-angled and 1-fld.: lvs. narrow-acuminate: fls. white or pale rose, the petals bluntly toothed; calyx-bracts very narrow and sharp. Caucasus.

liburnicus. Glabrous: sts. simple and stiff, to 2 ft. high, more or less 4-angled at least above, terminating in a 2–6-fld. head: fls. rose, spotted, about ¾ in. across; petals dentate; calyx-bracts stiff and long-pointed. S. and E. Eu.

longicaulis. Erect stiff plant to 2 ft., glabrous, simple or branched above and sts. more or less 4-angled: lvs. very narrow: fls. 1 or 2 at summit of st., rose, fragrant, about ¾ in. across; petals sharp-dentate; calyx cylindrical, to 1 in. long, the bracts very short and broad. S. Eu.—The name has been applied also to a form of *D. Caryophyllus.*

microlepis. Per., dwarf and cespitose: lvs. short, soft: fls. very small, solitary among foliage, rose-color. High mts., Thrace.

mirabilis: *D. chinensis* var. *Heddewigii.*

monspessulanus. Sts. terete, branching at top, glabrous: fls. solitary or 2 or 3 near together, inodorous, rose, varying to white (var. **alba**) or carmine (var.

carmineus), 1 in. or more across; petals fringed to about the middle; sepals and bracts awn-tipped. Spain to Caucasus.

neglectus. Like *D. glacialis*, of which it is regarded as a var. by some writers, but radical lvs. acute, fls. solitary, calyx leathery in texture, bracts 4, petals not contiguous. S. Eu.

nobilis: *D. chinensis* var. *Heddewigii.*

ochroleucus: *D. chinensis* var. *Heddewigii.*

pallens: doubtful name.

Pancicii (*D. Velenovskyi*). Cespitose, glabrous, 1 ft. or more, with slender 4-angled sts.: lvs. rather soft, mostly in basal tuft: fls. rose, several together in a paniculate cyme or head. Balkans.

petræus. Cespitose or mat-forming, glabrous: sts. slender, simple or forked, 6–15 in. tall: lvs. green, sharp-pointed, 3-nerved: fls. white, about ¾ in. across, fragrant; petals dentate or fimbriate; calyx cylindrical, narrowed at apex, to 1 in. long; bracts 4, about ⅓ length of calyx. E. Eu.

pinifolius. Cespitose, roughish: st. simple and strict, to 1½ ft.: lvs. awl-like, the radical ones recurved: fls. rose, inodorous, 5–8 in a head; calyx reddish; bracts 4, aristate. S. E. Eu.

plumarius. GRASS PINK. Mat-forming, glabrous and glaucous, to 1½ ft., the sts. simple or branched above and 2–3-fld.: fls. rose, varying to purple, white and particolored, very fragrant, petals fringed to the middle or less; bracts 4, about ⅓ length of calyx. Austria to Siberia.—Cult. in various forms, some of them double; a popular strain is var. **semperflorens** (*D. semperflorens*). Named vars. of garden pinks may be offshoots of this species or hybrids with *D. Caryophyllus* and possibly other species; see *D. Allwoodii.*

præcox: doubtful name, probably *D. arenarius.*

Pritchardii: a cult. pink, perhaps of the *plumarius-Caryophyllus* group.

procumbens: *D. deltoides.*

prolifer. Glabrous simple or branching ann., to 2 ft., with inconspicuous little pink fls. in small heads terminating the stiff sts.; calyx and bracts dry. Eu.; nat. in U. S.—A weedy plant of little hort. interest.

puberulus: the hort. plant is probably the puberulent form of *D. carthusianorum.*

pubescens. Glandular-pubescent, rather weak: sts. terete and slender, much branched, to 1 ft.: foliage soft: fls. odorless, solitary or twin, long-peduncled; petals rose and spotted above, greenish underneath; calyx villous; bracts 2, spreading, long-pointed. S. E. Eu.

punctatus: *D. chinensis* var. *Heddewigii:* also a form of *D. Caryophyllus.*

pungens. Cespitose, glabrous, light green or somewhat glaucous, 1 ft., rhizomatous: sts. 1–3-fld., slender but strict: lvs. very narrow and sharp-pointed: fls. rose, the petals unequally dentate. France, Spain.

pyridicolus. The plant cult. under this name is a compact grayish-pubescent tufted little plant with leafy sts. 3–4 in. high: lvs. small and narrow: fls. solitary or close together, pink, the calyx-bracts awn-like. Greece.

Requienii. Cespitose, glabrous and glaucous: sts. slender, to 15 in., 4-angled, forked: lvs. short, narrow, strict: fls. purple, the petals dentate, somewhat rhomboid. Pyrenees.

rupicolus. One of the many vars. of *D. carthusianorum* (var. *rupicolus*): sts. many, to 16 in. high: lvs. linear: fls. dark red, 2–6 in a head; bracts obtuse, straw-colored. Eu.

Seguieri (*D. chinensis* var. *asper*). The European extension of *D. chinensis*, perhaps a distinct species differing in the panicled fls., and wide-spreading calyx-bracts.

semperflorens: see *D. plumarius.*

serpyllifolius. Puberulent little alpine, 2–4 in., with leafy slender more or less prostrate sts.: lvs. about ½ in. long, more or less obtuse: fls. red and purple, about ½ in. across, the petals separated and notched; bracts short. Probably Eu.

sinensis: *D. chinensis.*

speciosus: *D. superbus* var.

spiculifolius (*D. acicularis* var. *spiculifolius*). Not cespitose: sts. 10–12 in.: lvs. long-linear and acute: fls. rose to white, the petals palmatifid and barbulate; bracts 4, about ¼ length of tube. Russia and Rumania.—The plant sometimes catalogued under this name is said to be a form of *D. petræus.*

spinosus: *Acanthophyllum pungens.*

squarrosus. Cespitose: sts. terete, slender and spreading, glabrous, branched, to 2 ft.: lvs. linear, acute, recurved: fls. rose, few to each st., the petals not close together, pinnately multifid; bracts 4, about ⅓ length of calyx. Russia, Siberia.

stellaris: see *D. chinensis.*

Sternbergii. Cespitose and glaucous: sts. 4-angled, 2-fld., 6–12 in.: lvs. long-linear, spreading: fls. rose and spotted, fragrant, the petals not contiguous; bracts 4, purplish, ⅓ length of calyx. Portugal, Alps, Switzerland.

strictus. Cespitose and glabrous: sts. to 10 in., strict, slender, 1- or sometimes 2-fld.: fls. small, white, inodorous; petals not contiguous or close together and not fimbriate, oval-rhomboid. S. E. Eu.

subacaulis. Low, cespitose, glaucous, with several-headed caudex: sts. simple, 4-angled, 2-fld., 3–4 in.: fls. small, purple, standing above the tufts, the petals not contiguous, entire. Spain, France.

subcaulescens: listed name for a small alpine.

Sundermannii. Much like *D. strictus*, but more showy: petals to ⅓ in. broad, entire or nearly so, calyx ¾ in. long. Greece.

superbissimus: *D. chinensis* var. *Heddewigii.*

superbus. Light green glabrous plant with branching sts. to 2 ft. high: lvs. rather soft, flat: fls. pale rose or lilac, very fragrant, mostly to about 1½ in. across, few or many in lax panicle, the petals multifid nearly or quite to base; calyx cylindrical, to 1 in. long; bracts very short. Spain to Norway and Japan. Var. nanus, a dwarfer form with smaller fls., is offered. Var. **speciosus** (*D. speciosus*) is mostly lower than the species, sts. little branched and few-fld., branches divaricate, fls. much larger and more showy.

sylvestris. Cespitose, glabrous: sts. simple or branched, 6–16 in. tall and much exceeding the very narrow basal lvs.: fls. solitary, odorless, rose, to 1 in. across, petals contiguous and dentate; bracts very short and truncate. Spain to E. Eu. Var. **frigidus** (*D. frigidus*) is a dwarf form from Hungary.

tener. Glabrous, to 5 in. high, the slender sts. 1-fld.: fls. rose, spotted, the petals oblong-cuneate. France.

tenuifolius (*C. carthusianorum* var. *tenuifolius*, preferably). A green plant with very slender sts.: heads 3–6-fld., the bracts brown, coriaceous and very obtuse; fls. red.

vaginatus: a form of *D. carthusianorum.*

Velenovskyi: *D. Pancicii.*

versicolor. Glabrous plant with terete paniculately branched st. 10–12 in. high: lvs. narrow-linear, the uppermost scale-like: fls. with contiguous petals red and spotted above and greenish-yellow underneath; calyx-bracts obovate and spreading. Altai Mts., Siberia.

virgineus. Glabrous and glaucous, cespitose: sts. to 8 in. high, simple or sparingly branched: fls. solitary, fragrant, rose. S. Eu., Morocco.

viscidus. Plant cespitose and viscid-pubescent, to 1 ft., the sts. simple: lvs. soft, those on the st. appressed: fls. in fascicles of 3–6, purple and spotted, the petals few-toothed; bracts usually 4. Bulgaria, Greece, Turkey. Var. **Grisebachii** has fls. 2–3 in the fascicle and bracts 2.

Waldsteinei. Sts. terete, 10–14 in.: lvs. rather soft, spreading: fls. rose, very fragrant, to about 1 in. across; petals not contiguous, obovate, fringed to middle; bracts 4. Pyrenees, Alps.

warleyensis: a listed name, of the *D. carthusianorum* type.

Wimmeri. Allied to *D. superbus:* sts. terete, to 15 in.: lvs. soft, linear, acute: fls. purple, fragrant, in a lax forked panicle, the petals fimbriate nearly to base; bracts 4, mucronate, short. Switzerland north and east.

zonatus. Cespitose and somewhat woody at base, scabrous: sts. 4-angled and branched, about 1 ft. high: lvs. strict: petals very broad, purple with dark zones above, yellowish underneath. Asia Minor.—The name may be applied also to zoned forms of *D. chinensis.*

DIAPENSIA. *Diapensiaceæ.* Tufted evergreen plants with crowded mostly opposite entire lvs. and solitary bell-shaped fls.; suitable for the rock-garden.

lapponica. To 4 in.: lvs. to ½ in. long, obtuse: fls. white, to ¾ in. across, June–July. Circumpolar, extending southward on mts. of N. Y. and New England.

DIAPENSIACEÆ. Diapensia Family. About 6 genera in the north temp. zone of little evergreen shrublets or stemless per. herbs, having simple lvs., bisexual regular fls. with 5-lobed calyx and corolla, 5 stamens, superior 3-celled ovary and capsular frs.; allied to Primulaceæ. Diapensia, Galax, Pyxidanthera, Schizocodon and Shortia are cult. in rock-gardens and similar places, and employed as ground-cover.

DIASCIA. *Scrophulariaceæ.* S. African low slender herbs of many species ann. and per., with lvs. mostly opposite, fls. violet or rose in racemes, 2-lipped but the tube nearly lacking, the lower lip 2-spurred. One is grown in flower-gardens and also as a pot-plant. The cultural requirements are simple; easily propagated by seed.

Barberæ. Twinspur. Ann., 1 ft.: lvs. ovate, to 1½ in. long, toothed: fls. rosy-pink with yellow spot in throat, ½ in. across, in terminal racemes to 6 in. long.

DICENTRA (*Bicuculla. Bikukulla*). *Fumiariaceæ.* Per. herbs with ternately compound lvs., irregular rose, yellow or white fls. in racemes, the corolla heart-shaped or 2-spurred and closed at top, and capsular frs.; cult. in the flower- or wild-garden.

The plants thrive in fertile light soil, in usual exposures. Propagated by division of crowns or roots.

canadensis. Squirrel-Corn. To 1 ft., the root with many small tubers: lvs. all basal: fls. greenish-white tinged with purple, with short rounded spurs, nodding in simple racemes. N. S. to Tenn. and Neb.

chrysantha. Golden-Eardrops. To 5 ft., with leafy sts.: fls. sulfur-yellow, with very short spurs, erect in large panicled racemes. Calif.

Cucullaria. Dutchmans-Breeches. To 10 in.: lvs. all basal: fls. white tipped with yellow, with widely divergent spurs, nodding in simple racemes. N. S. to N. C. and Kans.

eximia. To 2 ft.: lvs. all basal: fls. rose or pink, with short rounded spurs, nodding in compound racemes. N. Y. to Ga.

formosa. To 1½ ft.: lvs. all basal: fls. rose-purple or rarely white, with short rounded spurs, nodding in compound racemes. B. C. to Calif.

spectabilis (*Dielytra spectabilis*). Bleeding-Heart. To 2 ft., with leafy sts.: fls. rosy-red, with short rounded spurs, in simple one-sided racemes. Japan.—An old garden plant. Var. **alba** has white fls.

DICHELOSTEMMA: *Brodiæa.*

DICHORISANDRA. *Commelinaceæ.* Perennials from trop. Amer. with sheathing alternate lvs. and irregular blue or purple fls. in racemes or panicles, on erect or ascending simple or branched sts.

Grown under glass, or out-of-doors in warm regions. They require abundant water in the growing season. Propagated by seeds, cuttings, and division.

cærulea: hort. name.

mosaica. St. spotted: lvs. cross-banded with white longitudinally and along cross-veins, purple underneath: fls. blue and white, close to foliage. Peru. Var. **gigantea** has large fls. and var. **undata** lacks white cross-veins.

thyrsiflora. To 3 ft. or more, nearly or quite simple: lvs. glossy green, not variegated: fls. blue. Brazil.

vittata: probably *Rhœo discolor* var. *vittata.*

DICHOTOMOUS: forked in pairs.

DICHROSTACHYS: *Cailliea.*

DICKSONIA. *Cyatheaceæ.* Greenhouse tree-ferns with a distinct trunk usually several ft. tall: lvs. large, 2–3-pinnate; sori marginal at the tips of veins: mostly in the tropics and subtropics of the southern hemisphere. See *Ferns.*

antarctica. Trunk to 50 ft., with matted aerial rootlets: lvs. to 6 ft. long, 3-pinnate, with lanceolate toothed segms. to 2 in. long. Australia.

cicutaria: *Dennstaedtia cicutaria.*

fibrosa. Trunk to 20 ft., stout, brown, covered with fibrous aerial rootlets: lvs. to 8 ft. long, 2–3-pinnate. New Zeal.—A frequent glasshouse fern.

pilosiuscula: *Dennstaedtia punctilobula.*

punctilobula: *Dennstaedtia punctilobula.*

squarrosa. Trunk to 20 ft., slender, black: lvs. to 8 ft. long, 2–3-pinnate, stiff and leathery. New Zeal.

DICRANOSTIGMA. *Papaveraceæ.* Herbs from Cent. Asia with woody roots, basal pinnatifid lvs. and alternate st.-lvs., orange or yellow fls., and capsular frs.; one species is grown in rock-gardens.

Franchetianum (*Chelidonium Franchetianum*). About 1 ft. high, glaucous: fls. orange, 1 in. across: caps. linear, to 3 in. long. China.

DICTAMNUS. *Rutaceæ.* One variable species ranging from S. Eu. to N. China, cult. for the ornamental fls. **D. albus** (*D. Fraxinella*). Dittany. Fraxinella. Gas-Plant. Burning-Bush. Hardy per. to 3 ft., strong-smelling and long-enduring: lvs. of 9–11 ovate lfts.: fls. white, about 1 in. long, in terminal racemes: fr. a 5-parted caps. Var. **caucasicus** is a very large form with longer racemes. Var. **purpureus** has dark fls. and var. **rubra** rosy-purple fls. *D. dahuricus* is a form of the species.—These plants do best in rich heavy soil. Propagated by seeds in open ground; these will germinate the following spring and seedlings may be set out permanently after two years. Propagated also by division but with more difficulty.

DICTYOGRAMMA: *Coniogramme.*

DICTYOSPERMA (*Linoma*). *Palmaceæ.* One variable monœcious unarmed feather-lvd. tree of the Mascarene Isls. in the Indian Ocean, sometimes regarded as 2 or 3 species: lvs. long and gracefully curving, with infl. on the trunk beneath the long lf.-sheaths: spadix 2 ft. or less long with a short stout peduncle and many spreading or hanging branches; fls. in 3's of which the central one is pistillate, spirally disposed on the cord-like branches; stamens 6, pistillode shorter than stamens, terete: fr. oblong to cartridge-shaped, ¾ in. or less long; albumen ruminate; stigma apical. Planted in S. Fla.; see *Palm.* **D. album** (*Areca alba*). To 40 or 50 ft.: lvs. 10 ft. long more or less; pinnæ curved or drooping, 2–3 ft. long and 2–3 in. broad, only the midrib very prominent, long-acuminate, green underneath. Var. **aureum** (*Areca aurea*). More slender and smaller and fls. smaller: young plants with orange or yellow petioles and veins. Var. **furfuraceum.** Petioles and sheaths of young plant tomentose. Var. **rubrum** (*Areca rubra* of hort.: see *Acanthophœnix*) in juvenile stage has very dark green lvs. with veins and margins reddish.

DIDISCUS: *Trachymene cœrulea.*

DIEFFENBACHIA. *Araceæ.* Trop. American erect shrubby plants bearing the oblong entire lvs. toward the top of the st., the petioles sheathing, the unisexual fls. borne on an erect spadix about the length of the oblong spathe; grown as foliage subjects in the greenhouse.

Several plants may be put in a large pot until they cease developing good leaves. They may then be topped and the stems cut into 2- or 3-inch pieces, dried for a few days, and then put in boxes of sand where they will throw off shoots which will root and form new plants.

Barraquiniana: *D. picta* var.

Baumannii: *D. Bowmannii.*

Bausei. Hybrid between *D. picta* and *D. Weirii,* (the latter a dwarf kind with yellow spotted lvs.) having yellowish-green lvs. with small white spots and glaucescent beneath.

Bowmannii (*D. Baumannii*). To 3 ft.: lvs, to 16 in. long and 8 in. wide, spotted with white, the petioles deeply channelled: spathes pale green, about 6 in. long. Colombia.

brasiliensis: *D. picta.*

costata. To 4 ft.: lvs. to 16 in. long and 1 ft. wide, deep green, paler beneath, the petioles channelled: spathes to 1 ft. long. Colombia, Peru.

Fournieri: hort. name.

imperialis. Lvs. to 2 ft. long and 1 ft. wide, shining green spotted with yellow and with whitish midrib, the petioles deeply channelled. Peru.

Jenmannii: *D. picta* var.

Leonii: hort. name.

Leopoldii: *D. Seguine* var. *liturata.*

magnifica: *D. picta* var.

picta (*D. brasiliensis*). To 4 ft.: lvs. shining green, irregularly marked with white and yellow: spathes about 6 in. long. S. Amer. Runs into many forms, some of which are: Var. **Barraquiniana** having lvs. spotted with white and petioles and midribs almost entirely white; var. **Jenmannii** with lvs. veined and spotted with white; var. **magnifica** (*D. Rex*) has lvs. spotted along veins with yellowish-green and petioles marked with white.

Rex: *D. picta* var. *magnifica.*

Seguine. To 6 ft.: lvs. green often variously spotted, pale green beneath, with thick midribs and petioles striped and dotted with white, not channelled: spathes green or pale green. Trop. Amer., where it is known as "dumb cane." Var. **liturata** (*D. Leopoldii*) has an irregular yellowish stripe along midrib.

splendens. Hybrid between *D. Leopoldii* and *D. picta* having lvs. spotted with white and deeply channelled petioles.

DIELYTRA: *Dicentra spectabilis.*

DIERAMA. *Iridaceæ.* Two S. African cormous herbs, sometimes grown in S. Calif. or under glass in cold climates. Cult. as for Ixia.

pendula. To 4 ft.: basal lvs. to 2 ft. long and ¼ in. broad: fls. white to pale or dark mauve, to 1 in. long, in several slender drooping spikes. Trop. and S. Afr.

pulcherrima (*Sparaxis pulcherrima*). To 4 ft.: lvs. very stiff, to 2 ft. long and ¼ in. wide: fls. bright purple, 1½ in. long, with short tube, in slender drooping spikes.

DIERVILLA. Bush-Honeysuckle. *Caprifoliaceæ.* Three little bushes of E. N. Amer., spreading by means of underground sts. and forming patches: lvs. opposite: fls. small, in spring and summer, yellow sometimes shaded reddish or brownish, borne in small leafless axillary clusters that are sometimes aggregated into terminal cymes, corolla more or less bilabiate: fr. a thin-walled taper-pointed caps. bearing the awl-shaped calyx-lobes at apex, indehiscent or essentially so. The Weigelas of gardens, sometimes referred to this genus, are here kept distinct. See *Weigela.*

The bush-honeysuckles are adaptable for holding banks and for colonizing in rear situations and for tall ground-cover. They propagate readily by suckers.

Lonicera (*D. trifida*). To 4 ft., glabrous or essentially so: lvs. ovate to oval, long-pointed, 2–4 in. long, petioled. Newf. to Sask. and south to N. C., on banks and in rocky places.

rivularis. To 6 ft., pubescent: lvs. ovate or narrower, long- or short-pointed, short-petioled: fls. in terminal clusters. N. C., Tenn., Ga., Ala., on damp banks and rocks; hardy in New England.

sessilifolia. To 4 or 5 ft., glabrous, with 4-angled branchlets: lvs. nearly or quite sessile, ovate-lanceolate and acuminate: fls. often in crowded terminal clusters. N. C., Tenn., Ga., Ala., on exposed rocky hillsides; hardy in New England.

trifida: *D. Lonicera.*

DIFFUSE: loosely branching or spreading; of open growth.

DIGITALIS. Foxglove. *Scrophulariaceæ.* Erect herbs with mostly tall and simple fl.-sts., grown in the border for their long racemes of tubular 2-lipped fls., the upper lip shorter than lower, in purple, yellowish or white, in summer: lvs. alternate and long and decorative, especially young rosettes, mostly ovate-lanceolate to lanceolate: native from Eu. to Cent. Asia.

Foxgloves are easily grown. The perennial species are propagated by seeds or by division. The common species and cultigens are usually treated as biennials, the seed sown in the spring or summer producing flowering plants the following season.

ambigua (*D. grandiflora. D. ochroleuca*). Yellow F. Per. or bien. to 3 ft., hairy: fls. 2 in. long, yellowish marked with brown, calyx-lobes linear. Eu., W. Asia.

Buxbaumii: hort. name for a yellow-fld. foxglove.

canariensis: *Isoplexis canariensis,* but the plant grown under this name is sometimes *D. ambigua.*

ferruginea. Rusty F. Per. or bien. to 6 ft.: fls. rusty-red, downy outside, lower lip bearded, middle lobe longer than others, calyx-lobes ovate. S. Eu.

gloxinioides: *D. purpurea* var. *gloxiniæflora.*

grandiflora: *D. ambigua.*

lævigata. Per. to 3 ft.: fls. yellow marked with purple, middle lobe of lower lip longer than others, calyx-lobes oblong. S. Eu.

lanata. Grecian F. Per. or bien. to 3 ft.: fls. 1 in. long, nearly white with fine veins, middle lobe of lower lip longer than others, calyx-lobes linear, racemes hairy. Danube region and Greece.

lutea. Straw F. Per. to 2 ft.: fls. yellow to white, to ¾ in. long, in one-sided racemes, upper lip 2-parted, calyx-lobes lanceolate. Eu.

nervosa. Per.: fls. yellowish, small, in long dense racemes. Cent. Asia.

ochroleuca: *D. ambigua.*

purpurea. Common F. Bien., sometimes per., to 4 ft.: fls. to 3 in. long, purple more or less spotted, with ciliate lobes, drooping in one-sided racemes to 2 ft. long; calyx-lobes broad-ovate. W. Eu. Hort. vars. are: **alba,** fls. white; **campanulata,** upper fls. united into a large bell-shaped bloom; **gloxiniæflora** (*D. gloxinioides*) has longer racemes and more open fls. than the type; **maculata superba,** Leopard F., improved spotted form; **monstrosa,** a double peloric form.

sibirica. Hairy per.: fls. yellowish, middle lobe of lower lip much longer than others, calyx-lobes linear. Siberia.

DIGITARIA: *Syntherisma.*

DIGITATE: hand-like; compound with the members arising from one point, as the leaflets of horse-chestnut. See *Palmate.*

DIHOLCOS: *Astragalus bisulcatus.*

DILL: *Anethum graveolens.*

DILLENIA. *Dilleniaceæ.* Warm-country trees, Asia to Australia, one intro. in southernmost parts of U. S.: lvs. alternate, large and strongly pinnately veined: fls. mostly large and showy, white or yellow, solitary or in clusters, the parts 5 or in multiples, the calyx enlarging and inclosing the fleshy fr.

indica (*D. speciosa*). To 40 ft., evergreen or losing its foliage in the dry season: lvs. oblong, thick, to 12 in., serrate, borne at ends of branches: fls. white, 6 in. or more across, with a mass of yellow stamens and a rayed stigma: fr. size of fist, acid, edible. Trop. Asia.

speciosa: *D. indica.*

DILLENIACEÆ. DILLENIA FAMILY. Trees, shrubs or rarely herbs of about a dozen genera, some having medicinal properties but only Actinidia, Candollea, Dillenia, and Hibbertia known in cult. in the U. S. outside botanic gardens. The family is characterized by mostly alternate lvs., yellow, white or rarely red usually bisexual fls. having commonly 5 sepals and petals, numerous stamens, and ovary of 1 to many carpels.

DILLWYNIA. *Leguminosæ.* Heath-like shrubs, mostly of small size, native in Australia and adapted to Calif.: lvs. scattered or alternate, narrow-linear or needle-like: fls. papilionaceous, yellow or orange-red, prevailingly in small axillary or terminal racemes or corymbs or sometimes solitary: pod ovate or broader.

Preissii. To 5 ft. with long erect branches: lvs. to ¾ in. long, stiff: fls. about 3 or less in the axils, standard somewhat exceeding calyx.

DIMORPHANTHUS: *Aralia.*

DIMORPHOTHECA. CAPE-MARIGOLD. *Compositæ.* S. African herbaceous or subshrubby annuals and perennials with white, purple, yellow or orange, solitary terminal heads of ray- and disk-fls. In Calendula the ray achenes are incurved, the lvs. entire or minutely toothed; in Dimorphotheca the ray achenes are straight, the lvs. conspicuously toothed.

Cape-marigolds are grown in the flower-garden and sometimes in the greenhouse and bedded out. They make a good display in warm sunny situations, requiring a long season for best results. Propagated by seeds and the perennial species by cuttings.

annua (*Calendula pluvialis*). Ann., rough-hairy: lvs. oblong: rays white or yellowish above, purplish below. Var. **ligulosa** (*Calendula Pongei*). Double, the rays white above, yellow or violet beneath.

aurantiaca (*Calendula Tragus*). Per. blooming as an ann., often shrubby: lvs. linear-oblong: rays orange-yellow.

Ecklonis. Per. or subshrub to 2 ft.: lvs. lanceolate or linear-lanceolate: rays white above, purplish beneath.

hybrida (*Calendula hybrida*). Hybrids between *D. annua* and *D. aurantiaca* with fls. varying from white to red, yellow and orange.

DINEMA. *Orchidaceæ.* One orchid native in trop. Amer., **D. polybulbon** (*Epidendrum polybulbon*). Rhizomes creeping, bearing pseudobulbs: lvs. to 2 in. long: fls. solitary, with yellow or brownish sepals and petals and snow-white lip yellow at base, Dec.–Feb.

DIOCLEA. *Leguminosæ.* Twining vines with lvs. of 3 lfts. and papilionaceous blue, red or white fls. in clusters or racemes; sometimes planted in warm regions. Propagated by seeds, cuttings, or suckers.

glycinoides. Fls. scarlet, 1 in. long. Argentina.—The botanical position of the plant grown under this name is much in doubt, and it may belong to another genus.

DIŒCIOUS: staminate and pistillate flowers on different plants.

DION (*Dioon:* see page 8). *Cycadaceæ.* Mexican palm-like or tree-fern-like plants with stiff pinnate lvs. and fls. borne in cones. For cult. and uses see *Cycas,* from which it differs in technical floral and fr. characters.

Dohenii. A plant not fully described and yet little known: lfts. broadest at base, very stiffly sharp-pointed, not toothed, glabrous, margins recurving, parallel side nerves about 12 and prominent. Erroneously reported from Guatemala.

edule. Trunk to 6 ft. high, very stocky: lvs. 3–5 ft. long; lfts. entire in adult plants but toothed at tip on young ones, side nerves 12 or less, sharp-pointed. Hot open situations.

spinulosum. Trunk to 50 ft. high, more slender: lvs. 4–6 ft. long; lfts. long, with separate slender spiny teeth on each margin, the parallel side veins 18 or more. Rain forests.

DIONÆA. *Droseraceæ.* One insectivorous per. of restricted range in N. C. and S. C., sometimes grown as an oddity or for botanical demonstration. The plant thrives in sunshine in a humid atmosphere. It should be potted in sphagnum or silver-sand and black silt and the pots set in about 1 in. of water. Propagated by seed under a bell-jar. **D. muscipula.** VENUS FLY-TRAP. Lvs. in basal rosettes, having flat petioles and round 2-lobed blades which are fringed with sensitive hairs, closing together when touched: fls. white, in umbels terminating scapes about 1 ft. high.

DIOON: *Dion.*

DIOSCOREA. YAM. *Dioscoreaceæ.* Herbaceous twining vines or perhaps more or less woody, in both eastern and western hemispheres and mostly of warm regions, with tuberous roots and often aerial tubers, simple or compound broad lvs. and small diœcious fls. in spikes or racemes.

Several species are cultivated in the tropics for the edible tubers, and a few in the North for ornament and interest. Yams are of easy cultivation and may be planted at any time of year where hardy. Propagated by seeds, tubers or cuttings. The word yam is sometimes applied to certain varieties of sweet potato.

alata. Tubers to 8 ft. long: sts. 4-winged or -angled, often with small axillary tubers: lvs. opposite, ovate to oblong and deeply heart-shaped at base. India to Malaya; not hardy N.

Batatas. CHINESE Y. CINNAMON-VINE. Tubers to 3 ft. long, deep in ground: sts. tall-climbing, slightly angled, bearing small axillary tubers: lvs. opposite, ovate, strongly broadened or angled at base. China;

hardy N., remaining for years, the tops dying to the ground.

bulbifera. AIR POTATO. With small or no root-tubers: sts. cylindrical, bearing axillary angular tubers to 1 ft. long: lvs. alternate, ovate, heart-shaped at base. Trop. Asia, Philippines; not hardy N.

cayenensis. YELLOW or ATTOTO Y. St. angled or cylindrical, prickly toward base: lvs. mostly opposite, ovate, deeply heart-shaped at base. W. Indies to Brazil; not hardy.

discolor. Root tuberous: lvs. ovate, heart-shaped at base, purplish beneath, white along midrib. S. Amer.—Grown as a greenhouse foliage plant.

macroura. Lvs. alternate, orbicular, heart-shaped at base, wavy-margined. Trop. Afr.

oppositifolia. Lvs. opposite, lanceolate to ovate, not heart-shaped at base. India, E. Indies.

trifida. CUSH-CUSH. YAMPEE. Tubers small: sts. angled or winged: lvs. 3–5-lobed to middle or lower. S. Amer.; not hardy.

villosa. WILD YAM. COLIC-ROOT. Rootstock woody, to ¾ in. thick: lvs. ovate, heart-shaped at base. R. I. to Fla. and Tex.

DIOSCOREACEÆ. YAM FAMILY. Ten genera of twining herbaceous or somewhat woody vines with woody or tuberous roots, widely distributed, characterized by monœcious or diœcious fls. having 6 perianth-segms. in 2 series, 6 or 3 stamens, typically 3-celled ovary, 3 styles, and capsular or baccate fr. Only Dioscorea, Rajania, Tamus and Testudinaria are in general cult.

DIOSMA. *Rutaceæ.* Heath-like shrubs native in S. Afr., with simple linear lvs., small white or red fls., and fr. of 5 carpels; cult. out-of-doors in the S. and under glass for ornament and use in floral decorations.

Soil for diosmas should be similar to that for heaths, fibrous loam and leaf-mold with sharp sand added. Plants should be cut back after flowering to induce bushy growth. Propagated by cuttings of young wood.

alba: *Coleonema album.*

capitata: *Audouinia capitata.*

ericoides. BUCHU. To 2 ft., with many branches, fragrant: fls. white and borne in great profusion.

purpurea: *Agathosma villosa.*

Reevesii: listed name.

DIOSPYROS. PERSIMMON. *Ebenaceæ.* Widely distributed trees and shrubs, largely Asian, with alternate simple lvs., unisexual or imperfect fls. in cymes or the pistillate solitary, and fr. a juicy edible berry with the enlarged calyx at base. *D. Kaki* and *D. virginiana* are grown for the edible fr., and others for ornament and interest.

Persimmons are not hardy North with the exception of *D. virginiana* which will stand in parts of New England. They succeed in most soils. Propagated by seeds, cuttings, and layers. For culture of *D. Kaki* see *Persimmon. D. Ebenaster*, the black sapote, thrives only in the tropics or perhaps will withstand two or three degrees of frost. Propagated by seeds and shield-budding. *D. Lotus* stands perhaps to north-central regions. The other species are tropical or of mild climates.

Cargillia. Small tree: lvs. oval, to 3 in. long, yellowish beneath: fr. black, ½ in. long. Australia.

chinensis: *D. Kaki.*

Ebenaster. BLACK SAPOTE. Tree to 60 ft.: lvs. oval or oblong, to 8 in. long, shining: fls. small, white: fr. olive-green, to 5 in. long, with chocolate-brown flesh. Mex., W. Indies.

Ebenum. Large tree with smooth branchlets: lvs. elliptic, to 4 in. long, thick: staminate fls. fascicled, pistillate solitary, corolla tubular: fr. ¾ in. diam. India.

Kaki (*D. chinensis*). KAKI. JAPANESE P. Tree to 40 ft.: lvs. ovate or obovate, to 7 in. long, shining above, pubescent beneath: fls. yellowish-white, about ½ in. long: fr. orange or reddish, to 3 in. across, with orange flesh. Japan, China, where it is much cult.

Lotus. DATE-PLUM. Tree to 45 ft.: lvs. oval or oblong, to 5 in. long, pubescent: fls. reddish or greenish, to ⅓ in. long: fr. yellow turning black, ½ in. across. W. Asia to Japan.

montana. Tree: lvs. ovate or oblong, to 4 in. long: fls. white, ¼ in. long: fr. reddish-brown, 1½ in. across. Trop. Asia.

virginiana. COMMON P. Tree to 50 ft. or more: lvs. ovate, to 6 in. long, shining above: fls. to ½ in. long: fr. yellow or orange, to 1½ in. across. Conn. to Fla. and Tex., in woods and fields.

DIOSTEA: *Baillonia juncea.*

DIOTIS. *Compositæ.* One per. less than 1 ft. high, growing along the European coast and useful in rock-gardens. Propagated by seeds or cuttings. **D. candidissima.** COTTON-WEED. White-tomentose: lvs. alternate, oblong, ½ in. long: heads ⅓ in. across, in dense terminal clusters, of disk-fls. only, Aug.–Sept.

DIPELTA. *Caprifoliaceæ.* Chinese deciduous shrubs allied to Diervilla and Weigela, with opposite lvs., pinkish or purple tubular-campanulate fls. solitary or in racemes, and fr. a caps. inclosed by large showy bracts. They are hardy in the N. and thrive in any good soil. Propagated by seeds in spring and by cuttings of green and hard wood.

floribunda. To 16 ft.: lvs. ovate to oval-lanceolate, to 4 in. long, entire: fls. pink with orange-yellow throat, fragrant, 1 in. long, the corolla slender at base; May: fr.-bract shield-like, to 1 in. across.

ventricosa. To 20 ft.: lvs. elliptic or narrower, to 5 in. long, mostly finely denticulate: fls. rose with orange throat, drooping, the corolla swollen at base: fr.-bract cordate, attached at base.

DIPHYLLEIA. *Berberidaceæ.* Two per. herbs native in E. N. Amer. and Japan, the former transferred to wild-gardens: lvs. large, peltate, 1 radical and 2 smaller cauline lvs.: fls. white, in a terminal cyme: fr. a berry.

cymosa. UMBRELLA-LEAF. To 2 ft.: basal lf. to 2 ft. across, deeply 2-lobed, with many toothed lobes: berries blue, about ½ in. long. Va. to Ga. and Tenn., in wet places in mts.

DIPLACHNE: *Leptochloa fascicularis.*

DIPLACUS: *Mimulus.*

DIPLADENIA. *Apocynaceæ.* Climbing shrubs, perhaps at first erect, with opposite lvs., large funnelform fls. in terminal or axillary racemes, white or rose corolla with 2 scales at base inside, and fr. of 2 spreading follicles; native in trop. S. Amer., grown in greenhouses, and out-of-doors in the S. *D. splendens* and *D. boliviensis* are the usual species in cult; other names are likely to represent hort. derivatives.

Dipladenias may be grown under heat with good drainage, in a soil composed of fibry peat, sand and charcoal. Propagated by cuttings over bottom heat.

amabilis. Fls. rosy-crimson.

amœna. Fls. pink, suffused with rose.

boliviensis. Lvs. oblong, to 3½ in. long: fls. white, the throat yellow inside, 1½ in. across, 3 or 4 together. Bolivia.

Brearleyana. Fls. pink, changing to crimson.

hybrida. Fls. bright crimson-red.

insignis. Fls. rosy-purple.

profusa. Fls. bright rose.

rosea. Fls. pink with purple eye, to 4 in. across.

splendens. Lvs. oval, to 8 in. long, heart-shaped at base: fls. white suffused with rose, 4 to 6 together. Brazil.

DIPLAZIUM. *Polypodiaceæ.* Ferns closely resembling Asplenium and requiring the same general treatment, grown under glass, differing in the arrangement of the sori; mostly in the warmer zones. See *Ferns.*

lanceum (*Asplenium lanceum*). Lvs. simple, lanceolate, to 9 in. long and 1 in. wide, usually entire. India, China, Japan.

DIPLOGLOTTIS. *Sapindaceæ.* One tall Australian tree, sometimes planted in S. Calif. **D. Cunninghamii** (*Cupania Cunninghamii*). Lvs. pinnate, of 8–12 oblong or ovate-lanceolate lfts. to 1 ft. long, pubescent beneath: fls. greenish, in large panicles: fr. a tomentose caps. ½ in. across, the seed inclosed in a pulpy aril from which jam is made in Australia.

DIPLOTAXIS. ROCKET. *Cruciferæ.* A score of mustard-like erect ann., bien. or per. herbs of Eu. and the Medit. region, one of them sometimes raised for ornament: lvs. pinnatifid or lobed: fls. yellow, white, rose or lilac, in terminal racemes: pod or silique elongated. **D. erucoides** is ann., to 18 in., branching from base: lower lvs. lyrate: fls. white, veined rose or lilac. In cult. fields, Eu., coming quickly to bloom.

DIPLOTHEMIUM: D. campestre is *Allagoptera campestris:* **D. caudescens** is *Polyandrococos caudescens.*

DIPSACEÆ. TEASEL FAMILY. Old World herbs of about 7 genera, having mostly opposite lvs., small bisexual fls. in dense involucrate heads or spikes, like composites, with gamopetalous 2–5-lobed corolla, 2–4 stamens, inferior 1-celled ovary, and fr. an achene, and the general looks of Compositæ. A few genera are cult. for ornament or commercial purposes, as Cephalaria, Dipsacus, Morina, Pterocephalus, Scabiosa, Succisa.

DIPSACUS. TEASEL. *Dipsaceæ.* Bien. prickly or hairy coarse tall herbs with opposite entire or pinnately cut lvs. and 4-lobed fls. in terminal heads or spikes subtended by spiny involucral bracts; plants of thistle-like aspect; native in Eu., Asia, N. Afr. A few species are grown in the garden and *D. fullonum* for raising the nap on woollen cloth.

asper. To 6 ft.: lower lvs. pinnatifid, rough and hairy: fls. white. Himalayas.

chinensis. To 6 ft.: lvs. pinnately cut into about 8 pairs of coarsely toothed bristly lobes: heads globose, to 2 in. across, the involucral bracts shorter than head and recurved, stamens long-exserted. China.

fullonum. FULLERS T. To 6 ft.: lvs. lanceolate or oblong, to 1 ft. long, entire or toothed, sessile: fls. pale lilac, in cylindric heads to 4 in. long, the involucral bracts shorter than head and becoming reflexed, bracts of receptacle with hooked tips and the dry head employed by fullers. Eu.; grown as a special crop in U. S., and somewhat escaped.

pilosus. To 4 ft.: lvs. oblong, entire or toothed, petioled: fls. yellowish-white, in globose heads to 1 in. across, the involucral bracts equalling those of receptacle and shorter than head, bristly. Eu.

sylvestris. COMMON T. Differs from *D. fullonum* in the involucral bracts as long as or exceeding head and curved upward. Eu., Asia; extensively nat. in E. N. Amer.

torsus: hort. name.

DIPTERONIA. *Aceraceæ.* Two Chinese deciduous trees with odd-pinnate opposite lvs. and imperfectly monœcious little fls. in large terminal panicles: fr. winged all around. **D. sinensis,** adapted to southern states and Calif., is 30 ft. or more: lfts. 4–6 pairs, narrow-ovate to oblong, serrate: fls. whitish, very small: samara about 1 in. across.

DIRCA. LEATHERWOOD. *Thymelæaceæ.* Two deciduous bushes native in the U. S., with tough flexible branches and yellowish funnelform declined or pendent short-stalked bisexual fls. in advance of the simple alternate lvs.: fr. a small red or greenish drupe. **D. palustris,** N. B. to Mo. and Fla. in damp or fertile woods and copses, is a neat shrub to 6 ft.: lvs. elliptic to obovate, 2–3 in. long, entire.

DISA. *Orchidaceæ.* Terrestrial African orchids with tuberous rootstocks and leafy sts., the fls. with large helmet-shaped dorsal sepal, small petals and lip; require moist situations in the greenhouse. For cult. see *Orchids.*

grandiflora: *D. uniflora.*

Luna. Hybrid between *D. racemosa* and *D. Veitchii.*

racemosa. Fls. rose-red in effect, marked with purple, about 1½ in. across, in one-sided racemes to 9 in. long. S. Afr.

uniflora. To 2 ft., with 1–5-fld. sts.: fls. to 4 in. across, with scarlet lateral sepals and bright red dorsal sepal whitish within and with short spur, July–Aug. S. Afr.

Veitchii. Fls. rose-lilac, about 2½ in. across. Hybrid of *D. racemosa* and *D. uniflora.*

DISCARIA. *Rhamnaceæ.* Mostly S. American spiny shrubs, but one kind in Australia and another in New Zeal., with small opposite or clustered lvs. or sometimes lacking, axillary fls. and fr. a leathery drupe or caps.; sometimes grown for ornament.

serratifolia. To 12 ft., with pendulous branches, spines to 1 in. long: lvs. to 1 in. long, narrow-oblong: fls. greenish-white, many, ⅛ in. across, fragrant. Chile, Patagonia.

Toumatou. To 15 ft., divaricately much branched, spines 2 in. long: lvs. to ¾ in. long, linear-obovate: fls. many, greenish-white, ⅙ in. across. New Zeal.; grown in S. Calif.

DISCOCACTUS. *Cactaceæ.* Low plants, globose or flattened endwise, with many tubercled ribs, spines clustered at the areoles and usually curved: fls. in a small head from the center of the plant, nocturnal, with a tube, white or pinkish: fr. naked. E. S. Amer. Differs from Cactus in its night-blooming habit and flower-limb of many rather than few segms.; not to be confused with the very different genus Disocactus. See *Cacti.*

Besleri: *D. placentiformis.*

placentiformis (*D.* and *Melocactus Besleri*). Plant depressed, broader than high, blue-green; ribs broad and low, 10–14, radial spines 6 or 7, central usually wanting: fls. somewhat elongated, rose-color. Brazil. —Long in cult. but apparently seldom seen.

DISEASES: see *Fungi and Fungicides:* also *Insects and Insecticides.*

DISK, DISC: a more or less fleshy or elevated development of the receptacle about the pistil; also the receptacle in the head of Compositæ; a flattened extremity, as on tendrils of Virginia creeper.

DISK-FLOWERS: the tubular flowers in the center of heads of Compositæ, as distinguished from the ray-flowers.

DISOCACTUS. *Cactaceæ.* Spineless epiphytic plants with terete st. and flattened often more or less leaf-like branches, of bushy habit: fls. diurnal, near tips of branches, the tube shorter than limb and segms. few. Two species in Cent. Amer.; not to be confounded with Discocactus. See *Cacti.*

biformis (*Cereus* and *Phyllocactus biformis. Epiphyllum biforme*). Becoming pendulous, plant 8 in. or more long; branches ½–¾ in. broad and 3 in. long, serrate: fls. purple-red, about 1½ in. long. Honduras, Guatemala.

DISPHYMA. *Aizoaceæ.* Segregate from Mesembryanthemum (which see for cult.): sts. prostrate: stigmas and fr.-cells 5, with 2-lobed tubercle at opening of each cell. **D. australe** (*M. australe*). Per., rooting at joints: lvs. opposite, oblong, flattened or 3-angled, mostly obtuse: fls. solitary, reddish, 1 in. across. Australia, New Zeal., Pacific Isls. **D. clavellatum** is similar but has somewhat clavate lvs. Australia.

DISPORUM. Fairy Bells. *Liliaceæ.* Per. woods herbs with slender rhizomes, alternate lvs., white or greenish-yellow drooping fls. solitary or in few-fld. umbels, and fr. a berry; sometimes planted in the wild-garden.

lanuginosum. To 2½ ft.: lvs. to 4½ in. long and 2 in. wide: fls. greenish, ¼ in. long: berries red. Ont. to Ga. and Tenn.

oreganum. To 2 ft.: lvs. to 3½ in. long and 2 in. wide, cordate at base: fls. creamy-white, ½ in. long. B.C. to Ida. and Ore.

DISSECTED: divided into many slender segments.

DISTEGIA: *Lonicera involucrata.*

DISTICTIS. *Bignoniaceæ.* Trop. American woody vines with lvs. of 2–3 entire lfts. and often a terminal tendril, purple or pink funnelform fls. in terminal racemes or panicles, and oblong smooth frs.; one species grown in S. Calif.

cinerea: *D. lactiflora.*

lactiflora (*D. cinerea*). Lfts. ovate or oblong, to 2½ in. long, pubescent: fls. purple, to 3½ in. long and limb 2½ in. across, tomentose outside: fr. to 3½ in. long. Mex.

DISTYLIUM. *Hamamelidaceæ.* A few evergreen trees and shrubs native in Asia, diœcious, monœcious or polygamous, with alternate lvs., fls. without petals but with small bracts, borne in axillary racemes; hardy only in warm regions. Propagated by seeds and by layers.

racemosum. To 80 ft., shrubby in cult.: lvs. elliptic, to 3 in. long, entire, dark green and shining above, sometimes with irregular margins: fls. with red anthers, in racemes 2–3 in. long. Japan. Var. **variegatum** has lvs. bordered or splashed yellowish-white.

DITCH-MOSS: *Elodea canadensis.*

DITTANY: *Dictamnus albus.* **Maryland**: *Cunila origanoides.*

DIVIDED: separated to the base.

DIVI-DIVI: *Cæsalpinia coriaria.*

DIZYGOTHECA. False Aralia. *Araliaceæ.* Shrubs or small trees, probably native in the Pacific Isls., with alternate digitately compound lvs., small fls. in umbels, and berry-like frs. The species or names are not well understood.

Tender foliage plants grown in the greenhouse in the juvenile state as pot specimens and seldom coming to flower. A good soil is one composed of equal parts sandy loam and peat or leaf-mold. For propagation see *Polyscias.*

elegantissima (*Aralia elegantissima*). Lvs. of 7–11 thread-like drooping lfts.; petioles mottled with white.

Kerchoveana (*Aralia Kerchoveana*). Lvs. of 7–11 prominently notched lfts. about ½ in. wide; petioles mottled.

Veitchii (*Aralia Veitchii*). Lvs. of 9–11 toothed or wavy-margined lfts. about ¼ in. wide, reddish beneath. Var. **gracillima** has very narrow lfts. with white midribs.

DOCK: *Rumex.* **PRAIRIE**: *Silphium terebinthaceum.*

DOCKMACKIE: *Viburnum acerifolium.*

DOCYNIA. *Rosaceæ.* A few partially or wholly evergreen small trees of farther Asia allied to apples and pears, sometimes planted for ornament and interest in the warmer parts of the U. S., the fruits more or less employed in other countries in cooking: the genus belongs with the Cydonia or quince group bearing several to many seeds in each carpel: lvs. simple, sometimes shallowly lobed: fls. white, in small umbels, appearing before the lvs. or with them, the calyx and pedicels tomentose.

Delavayi (*Pyrus Delavayi*). Evergreen, to 30 ft.: lvs. ovate-lanceolate, entire, to 4 in. long, tomentose underneath: fr. ovoid, about 1 in. long. China.

docynioides. Deciduous or only partially evergreen: lvs. elliptic or broad-lanceolate, often serrate toward apex, to 3 in. long, thinly pubescent becoming glabrous underneath: fr. nearly globose, about 1 in. diam. China.

DODECATHEON. Shooting-Star. American Cowslip. *Primulaceæ.* N. American small per. herbs, of woods, prairies and mts., with basal lvs., nodding cyclamen-like fls. borne in umbels on scapes, the corolla-lobes reflexed, the long slender anthers connivent into a cone.

Sometimes planted, and grown in well-drained soil in a shady place; useful in the wild-garden and some species in the rock-garden. Propagated by division and seeds.

Clevelandii. Lvs. to 2½ in. long: fls. purple with yellow base, varying to white; filaments of stamens purple, anthers yellow. S. Calif.

Hendersoni. Similar to above but anthers deep purple. Calif. to Wash.

integrifolium: *D. Meadia.*

Jeffreyi. Lvs. to 1 ft. or more long: fls. deep red-purple; filaments and anthers purple. Calif. to Ida. and B. C.

latilobum. Lvs. to 10 in. long: fls. yellowish-white; filaments very short, anthers purple. Wash., Ore.

Meadia (*D. integrifolium*). Lvs. to 6 in. long: fls. rose, white at base; filaments reddish-yellow, anthers purple. Pa. to Tex.

radicatum. Lvs. to 5 in. long: fls. rose or reddish; anthers purple. Kans. to N. Mex.

salinum. Lvs. to 1¾ in. long: fls. lilac with yellowish throat, anthers purple. Sask. to Ida. and Utah.

DODONÆA. *Sapindaceæ* (or *Dodonæaceæ*). Small trees and shrubs with alternate simple or sometimes compound lvs.: fls. small, polygamous or diœcious: frs. capsular, winged: sometimes planted for ornament in warm regions. Some species carry medicinal properties, and most of them have resinous sticky excretions. They are native of trop. and semi-trop. regions in both hemispheres.

attenuata. Viscid shrub, somewhat like narrow-lvd. *D. viscosa*, but lvs. linear-cuneate or long and linear, only slightly sinuate-toothed, to 2½ in. long: fls. in short simple racemes. Australia.

cuneata. HOP-BUSH. Shrub, usually viscid: lvs. obovate or cuneate, to 1 in. long: fls. in terminal racemes or axillary clusters. Australia.

madagascariensis. Tree to 14 ft.: lvs. of about 12 pairs of linear-lanceolate lfts. to 1½ in. long. Madagascar.

ptarmicæfolia. Tall shrub, sometimes viscid, young branches angled: lvs. linear-lanceolate and acuminate, to 3 in. long and in some cases more, serrate or entire: fls. in terminal racemes or panicles. W. Australia.

spatulata: considered to be one of the forms of *D. viscosa*.

Thunbergiana. Shrub to 10 ft., glabrous: lvs. lanceolate to linear-lanceolate, to 2½ in. long: fls. in dense racemes. S. Afr.

viscosa. Shrub to 15 ft., viscid: lvs. obovate-oblong to lanceolate, to 4 in. long: fls. in short racemes. Widely distributed in Fla. and W. Indies; a variable species.

DOELLINGERIA: *Aster umbellatus*.

DOGBANE: *Apocynum*.

DOGSTAIL, CRESTED: *Cynosurus cristatus*.

DOGWOOD: *Cornus*.

DOLICHANDRA. *Bignoniaceæ*. One Brazilian climbing shrub, suitable for greenhouse cult. **D. cynanchoides** (*Macfadyena cynanchoides*). Lvs. of 2 oblong entire lfts. to 2 in. long and a 3-parted terminal tendril: fls. red, tubular, to 2½ in. long, stamens long-exserted, calyx split and spathe-like: caps. linear, to 4 in. long.

DOLICHOLUS: *Rhynchosia*.

DOLICHOS. *Leguminosæ*. Mostly twining herbs or subshrubs with trifoliolate lvs., papilionaceous fls. solitary or clustered in the axils, and flattened beaked pods; native in the tropics where several species are grown for human food, as forage and green-manure crops, but in N. Amer. cult. chiefly for ornament. Seeds should be sown in spring where the plants are to stand.

biflorus. Ann. twiner: lfts. 1–2 in. long: fls. yellow: pods to 2 in. long, with gray seeds. India.

Hosei. Forming mats to 6 in. thick: lfts. to 1½ in. long and ¾ in. broad: pods ⅙ in. across. Borneo.—Grown as cover-crop and propagated by cuttings.

japonicus: *Pueraria Thunbergiana*.

Lablab. HYACINTH BEAN. BONAVIST. LABLAB. Per. but grown as ann.: lfts. to 6 in. long and very broad: fls. purple or white: pods to 2½ in. long, with black or white seeds. Probably Old World but widely spread in tropics, and common in cult. Var. giganteus is a large form with white fls. The hort. form Darkness has violet-purple fls. and black seeds and Daylight white fls. and white seeds.

lignosus. Per., evergreen: lfts. to 1½ in. long, triangular-ovate: fls. rose-purple or white in var. alba: pods to 1 in. long, with black seeds. Probably Asia.

sesquipedalis: *Vigna sesquipedalis*.

DOLICHOTHELE. *Cactaceæ*. Three small globose and more or less cespitose Texan-Mexican cacti segregated from Mammillaria, soft in texture and juice not milky, tubercles long: fls. in axils of old tubercles, large, tube funnelform, yellow. See *Cacti*.

longimamma (*Mammillaria longimamma*). Solitary or cespitose, to 4 in. high, tubercles 2 in. long, spines puberulent, the radials 6–12 and centrals 1–3: fls. 2 in. long more or less. Cent. Mex.

sphærica (*Mammillaria sphœrica*). Depressed plant growing in masses that may be 8 in. across, tubercles ½ in. long, more or less, spines glabrous, the radials 12–15 and central solitary: fls. about 2½ in. across when wide open. S. Tex., N. Mex.

DOMBEYA (*Assonia. Astrapæa*). *Sterculiaceæ*. African shrubs or small trees with alternate palmately-veined lvs., showy fls. in cymes or heads, and capsular fr.; ornamental subjects in the tropics and semi-tropics and sometimes grown in the greenhouse. Propagated by seeds, or by cuttings over heat.

calantha. To 12 ft.: lvs. 3–5-lobed, toothed, tomentose beneath: fls. rose, 1½ in. across. Cent. Afr.

Cayeuxii. Hybrid between *D. Mastersii* and *D. Wallichii*: fls. pink, in drooping many-fld. umbels.

Mastersii. To 5 ft.: lvs. toothed, densely tomentose beneath: fls. white, fragrant, in many-fld. umbels. Trop. Afr.

nairobensis. To 6 ft.: lvs. wavy-margined, densely white-tomentose beneath: fls. pink, in umbels. Nairobi.

natalensis. Shrub or small tree: lvs. poplar-like, toothed, becoming glabrous beneath: fls. white, fragrant, in umbels. Natal.

punctata. To 10 ft.: lvs. toothed or angled, tomentose beneath: fls. pink, in umbels. Mauritius, Bourbon.

spectabilis. To 10 ft.: lvs. wavy-margined, densely white- or rusty-tomentose beneath: fls. white, in umbels. Madagascar, trop. Afr.

Wallichii. To 30 ft.: lvs. toothed, densely tomentose beneath: fls. scarlet or pink, in many-fld. very large dense hanging heads. Madagascar, E. Afr.—Commonly planted in warm countries.

DOODIA. *Polypodiaceæ*. Dwarf dense ferns suitable for window-boxes and protected ferneries, with stiff pinnate or pinnatifid lvs.; sori in rows parallel to midrib; native Ceylon to New Zeal.

They are to be protected from strong sunlight, and require an intermediate or cool atmosphere; propagated by spores and sometimes by division. Mostly grown under glass, often under benches. See *Ferns*.

aspera. HACKSAW-FERN. Lvs. pinnatifid, to 1½ ft. long and 4 in. wide, very rough, segms. to 3 in. long. Australia.

caudata. Lvs. pinnatifid or pinnate at base, to 1 ft. long and 2 in. wide, slightly rough, segms. to 1½ in. long. New Zeal., Australia.—Some of the material cult. as *D. aspera* belongs here.

DORITIS. *Orchidaceæ*. One terrestrial Phalænopsis-like orchid native in Burma, Cochin-China and Siam. **D. pulcherrima** (*Phalænopsis Esmeralda*). To 2 ft.: lvs. to 8 in. long and 2 in. wide: fls. violet or purple varying to white, to 1½ in. across, in 10–15-fld. racemes, Sept.–Nov.

DORONICUM. LEOPARDS-BANE. *Compositæ*. Herbaceous perennials: basal lvs. long-petioled, st.-lvs. alternate, often clasping: heads yellow, long-stalked, with one row of ray-fls., showy in spring and summer; pappus of hairs. Native in Eu. and temp. Asia.

Doronicums thrive under the average garden conditions, and are frequent in borders. Increased either by seeds or divisions.

austriacum. To 4 ft., hairy: lvs. toothed, ovate, cordate at base: heads several. Eu.

caucasicum. To 2 ft., somewhat hairy: lvs. coarsely toothed, ovate, cordate at base: heads solitary. Sicily to Asia Minor.

Clusii (*Arnica Clusii*). To 2 ft.: lvs. ovate or oblong, toothed, not cordate at base: heads solitary. S. Eu.

Columnæ: *D. cordifolium.*

cordifolium (*D. Columnæ*). To 5 in., glabrous: lvs. cordate-ovate to ovate-lanceolate, toothed or lobed: heads solitary. S. E. Eu. and W. Asia.

excelsum: *D. plantagineum.*

macrophyllum. To several ft.: lvs. cordate-ovate, coarsely toothed: heads in corymbs. Caucasus, Persia.

magnificum: hort. name.

Pardalianches. To 4 ft., hairy, roots tuberous: lvs. toothed, ovate to oblong, cordate at base: heads 1–5. Eu.

plantagineum (*D. excelsum*). To 5 ft., roots tuberous: lvs. toothed, ovate to oblong: heads 2–4 in. across, solitary. Eu.

DOROTHEANTHUS. *Aizoaceæ.* One of the Mesembryanthemum segregates represented in cult. by one showy flower-garden ann. **D. gramineus** (*M. lineare. M. pyropæum. M. tricolor*). Low densely-fld. clump to 8 in. across, somewhat tubercled: lvs. opposite, more or less fleshy, linear, to 3 in. long: fls. solitary, to 1½ in. across, light pink, rose, white, red, sometimes blue- or red-centered. S. Afr.

DORSAL: back; relating to the back or outer surface of a part or organ.

DORSTENIA. *Moraceæ.* Trop. herbs with basal lvs. and unisexual fls. imbedded in the flat dilated receptacle (something like a fig opened out); grown under glass for botanical study as an example in morphology of the receptacle or torus. Propagated by division or seeds.

Contrajerva. Lvs. to 8 in. long and as broad, deeply lobed or entire, the petioles to 10 in. long: receptacles about 1 in. long and broad, peltate. Trop. Amer.

DORYALIS: *Dovyalis.*

DORYANTHES. Spear-Lily. *Amaryllidaceæ.* Very large succulent plants native in the deserts of Australia, with lvs. in basal rosettes and large red fls. in panicles or heads, the perianth-segms. nearly distinct; occasionally cult. in the S. and Calif. Propagated slowly by suckers.

excelsa. To 18 ft.: lvs. many, sword-shaped, to 4 ft. long: fls. to 4 in. long, in globular heads to 1 ft. across, with green bracts.

Palmeri. To 10 ft.: lvs. sword-shaped, to 6 ft. long and 4 in. broad: fls. 2½ in. long, whitish inside, the heads or spikes in panicles to 3 ft. long, the bracts colored.—Perhaps a var. of *D. excelsa.*

DORYCNIUM. *Leguminosæ.* Herbs or subshrubs from Medit. region and the Canary Isls., somewhat clover-like, with lvs. of 3 or 5 lfts., papilionaceous fls. in heads, and small cylindrical pods. Of easy cult. for ornament. Propagated by seeds or division.

herbaceum. To 2 ft., herbaceous: fls. white marked with dark purple, ½ in. across, May–July. S. Eu.

hirsutum. To 2 ft., shrubby, whole plant white-hairy: fls. white, in heads to 1½ in. across, July–Sept. S. Eu.

rectum. To 2 ft., shrubby: fls. rose-colored, in heads to ¾ in. across, July–Oct. S. Eu.

suffruticosum. To 2 ft., much branched, shrubby, gray-green: fls. white, marked with dark blue, in heads ½ in. across, Apr.–June. S. Eu.

DORYOPTERIS. *Polypodiaceæ.* Small trop. American ferns with lobed or entire attractive fronds, the sori confluent in a marginal line; something like Pteris and requiring similar handling. See *Ferns.*

palmata. Lvs. to 9 in. long and wide, palmately divided into 5 or more triangular lobes, stalks black. W. Indies to Brazil.

DOSSINIA. *Orchidaceæ.* One terrestrial species native in Borneo, suitable for a warm greenhouse. **D. marmorata** (*Anœctochilus marmoratus*). To 14 in.: lvs. to 3 in. long, broadly elliptic, dark green veined and marbled with gold: fls. bright brown tipped with white, about 2 in. long, in many-fld. racemes, July–Oct.

DOUBLE: said of flowers that have more than the usual or normal number of floral envelopes, particularly of petals; full.

DOUGLASIA. *Primulaceæ.* Tufted per. herbs with lvs. in rosettes and yellow or rose fls. in 1–7-fld. umbels terminating the scape; one species grown in the rock-garden. Cult. as for *Androsace.*

Vitaliana (*Androsace* and *Gregoria Vitaliana*). Sts. prostrate, tipped by rosettes of small linear hairy lvs.: fls. yellow, long-tubed, nearly sessile, solitary or 1–2. Alps, Pyrenees.

DOVE-FLOWER: *Peristeria elata.*

DOVE-TREE: *Davidia.*

DOVYALIS (sometimes but not originally spelled *Doryalis*). *Flacourtiaceæ.* Shrubs or small trees, with or without axillary spines, having alternate simple lvs., fls. diœcious, small and inconspicuous, and fr. an edible berry; native in Afr. and Ceylon.

The plants are suitable for subtropical climates, the umkokolo withstanding drought and lower temperatures than the kitambilla. To insure fruit both staminate and pistillate plants must be provided. Propagated by seeds, layering and shield-budding.

caffra (*Aberia caffra*). Kei-Apple. Umkokolo. To 20 ft., with long stiff thorns: lvs. to 2 in. long, often in clusters at base of thorns: fls. greenish: fr. 1 in. diam., yellow, acid, used for pickles and preserves. S. Afr.

hebecarpa (*Aberia Gardneri*). Kitambilla. Ceylon-Gooseberry. To 20 ft., much branched: lvs. to 4 in. long: fr. maroon-purple, 1 in. across, edible. India and Ceylon.

DOWNINGIA. *Lobeliaceæ.* Small annuals from W. N. and S. Amer., on low plains and in valleys, with alternate entire lvs., blue, yellow or white 2-lipped fls. borne in the axils of lvs. or bracts, and fr. a linear caps.; sometimes grown in the flower-garden. Propagated by seeds.

elegans (*Clintonia elegans*). To 7 in.: lvs. oblong to oblong-lanceolate, to ¾ in. long: fls. light blue with white throat marked with green or yellow, the stamen-column long-exserted. Wash. to Calif.

pulchella (*Clintonia pulchella*). To 10 in.: lvs. oblong-ovate, ½ in. long: fls. deep blue with white center of lower lip marked with yellow and purple, stamen-column scarcely exserted. Ore. to Calif.

DOWNY: covered with very short and weak soft hairs.

DOXANTHA. *Bignoniaceæ.* Trop. American woody vines of 2 species, with lvs. of 2 lfts. and a terminal 3-parted claw-like tendril, funnelform 5-lobed fls. solitary or few together, and linear leathery frs. Grown out-of-doors in the S. where it will stand a few degrees of frost, and also in the greenhouse. Propagated by cuttings under glass.

capreolata: *Bignonia capreolata.*

Unguis-cati (*Bignonia Unguis-cati* and *Tweediana. Batocydia Unguis*). CATS-CLAW. Lfts. ovate to lanceolate, 2 in. long: fls. bright yellow, to 3 in. long and 4 in. across: frs. 1 ft. or more long. W. Indies to Argentina.

DRABA. *Cruciferæ.* Many little plants, ann., bien., per., mostly in north temp. and cold regions and in mts., a good number of them adaptable to alpine- and rock-gardens and cool borders: lvs. simple and small, the basal ones commonly forming a rosette, the sts. sometimes devoid of foliage, often with very deep tap-root: fls. small but dainty, white, yellow, rose or purplish, in terminal racemes: fr. a small pod or silicle, often globular or orbicular. The species are variable and difficult of determination.

Propagation is by seed sown a season in advance of blooming in the case of the biennials and perennials, and by division of the tufts.

Aizoon. To 6 in.: lvs. very numerous, broad-lanceolate, strongly ciliate, to ¾ in. long, in rosettes: fls. sulfur-yellow, on hairy scape, in many-fld. racemes. Eu.—Variable.

armata: *D. longirostra.*

athoa. To 4 or 5 in. high: lvs. broad-linear, to ¾ in. long, obtuse, ciliate: fls. yellow, in 8–20-fld. racemes. S. E. Eu.

aurea. Bien. or per., pubescent: lvs. oblanceolate to lanceolate, to 2 in. long, entire or sparingly serrate: fls. yellow to nearly white, in 15–30-fld. racemes. Arctic to Ariz., in several forms.

austriaca (*D. stellata*). Per., cespitose, to 4 in.: basal lvs. narrowly obovate, obtusish, entire or toothed at apex: fls. milk-white. Eu.

azoides. Per., tufted, to 4 in.: lvs. linear and acute, entire, to ½ in. long, in rosettes: fls. yellowish. Medit. region, in mts.

borealis. Cespitose, to 12 in., simple or somewhat branched: lvs. pubescent, ovate to oblong-ovate, to 1 in. long, with 1 or 2 teeth: fls. white. Arctic, Canada, Siberia.

bruniifolia. Per., tufted, to 4 in.: lvs. linear and obtuse, about ¼ in. long, in rosettes: fls. attractive orange. Medit. region, in mts.

cuspidata. Per., densely tufted, to 4 in.: lvs. linear and obtusish, to ½ in. long: fls. purplish. Medit. region, in mts.

Dedeana. Densely cespitose, scape to 2 in. high: lvs. oblong-linear, obtuse, in rosettes, ciliate, about ¼ in. long: fls. white, 3–10 in a raceme. Spain.

diversifolia: one of the many forms of *D. bruniifolia*, from Armenia, the lvs. in rosettes rather broad and deflexed, those on offsets narrow and erect.

fladnizensis. Per., cespitose and cushion-like, 2–3 in. high: basal lvs. oblong, obtusish, mostly entire, to ⅓ in. long or more: fls. greenish-white. Arctic regions, and south in Eu. and Amer. in mts.

hirta. Per. to 10 in., hairy: basal lvs. narrow-lanceolate, sometimes toothed at apex, to ¾ in. long: fls. milk-white. Subarctic Eurasia.

hispanica. Densely cespitose, scape to 2 in. or somewhat more: lvs. in rosettes, linear and acutish, ciliate, to ½ in. or more long: fls. yellow, in 6–15-fld. racemes. Spain, in several forms.

incana. Bien. to 1 ft. high, gray-pubescent: lvs. lanceolate and obtusish, entire or sparsely dentate, to 1 in. long, the basal ones in rosettes: fls. white, sepals often purplish. Far north in Amer. and Eurasia.

lasiocarpa: form or synonym of another species.

laxa: form of *D. norvegica.*

longirostra (*D. armata*). Much like *D. aizoides* but smaller, to 1½ in. high in bloom. lvs. shorter, about ⅓ in. long: fls. yellowish, mostly 3–6 in a raceme. S. Eu., in many forms.

norvegica (*D. laxa. D. scandinavica*). Per. to 6 or 8 in.: lower lvs. oblong-lanceolate, acute, entire or few-toothed at apex, ciliate on margin, to 2 in. long: fls. white. Subarctic.

olympica. Per., cespitose and cushion-like, 2–4 in.: lvs. linear and obtusish, lightly ciliate, ¼ in. long: fls. orange, rather large. Medit. region.

pyrenaica: *Petrocallis pyrenaica.*

repens: *D. sibirica.*

rupestris. Per., forming tufts 1 in. or so broad, with very slender sts. with a single lf. or none, somewhat hairy: lvs. membranaceous, linear-lanceolate, entire or toothed at apex: fls. small, white. N. Eu.

scandinavica: *D. norvegica.*

sibirica (*D. repens*). Plant soft, green, the slender sts. more or less prostrate and sometimes 12 in. long: lvs. scarcely in rosettes, oblong-lanceolate, acute, entire, somewhat hairy: fls. yellow, on ascending sts. Siberia, Caucasus.

stellata: *D. austriaca.*

Sundermannii: listed name.

verna. WHITLOW-GRASS. Ann., 2–3 in. high, mostly in winter and blooming in spring: fls. small, white, the petals 2-cleft. Eu.; nat. in N. Amer.—Very variable; by some authors separated in the genus Erophila.

DRACÆNA. DRACENA. *Liliaceæ.* Trees and shrubs grown in the greenhouse, and out-of-doors in the S., for the handsome often vari-colored foliage; fls. rather small, in small clusters, borne in panicles. For cult. see *Cordyline*, to which most of the so-called dracenas belong and from which the genus differs in technical carpellary and floral characters.

amabilis: *Cordyline amabilis.*

australis: *Cordyline australis.*

Baptistii: a form of *Cordyline terminalis.*

Bruantii: a form of *Cordyline rubra.*

Cantleyi: an unidentified hort. name.

concinna. To 6 ft.: lvs. oblanceolate, the margins purple. Madagascar.

deremensis. To 15 ft.: lvs. to 2 ft. long and 2 in. broad: fls. dark red outside and white inside. Trop. Afr. Var. Warneckii is mostly grown.

Doucetii: a form of *Cordyline australis.*

Draco DRAGON-TREE. To 60 ft.: lvs. to 2 ft. long and 1¾ in. across, glaucous: fls. greenish: berries orange. Canary Isls.—Planted in Calif.

ensifolia: *Dianella ensifolia.*

fragrans. To 20 ft.: lvs. to 3 ft. long and 4 in. across: fls. yellowish, fragrant. Upper Guinea. Var. Lindeni has creamy-white bands on lvs. and var. Massangeana a broad yellow stripe down center. Var. canariensis is a hort. name.

Godseffiana. Lvs. to 5 in. long and 2½ in. or less across, irregularly spotted with white: fls. greenish-yellow. Upper Guinea.

Goldieana. Lvs. to 9 in. long and 5 in. across, with cross bars of gray and bright green: fls. white, in dense heads. Upper Guinea.

gracilis: an unidentified hort. name.

hybrida: hort. form of *Cordyline terminalis.*

imperialis: form of *Cordyline terminalis*

indivisa: *Cordyline indivisa.*

Kellerii: hort. form of *D. Godseffiana.*

Knerkii: form of *D. fragrans* with glossy light green lvs.

letigenosa: an unidentified trade name.

Lindeni: *D. fragrans* var.

Mandeana (**Mandaiana**?): a trade name.

Massangeana: *D. fragrans* var.

Rothiana: a garden form of *D. fragrans.*

rubra: *Cordyline rubra.*

Sanderiana. Lvs. to 9 in. long and 1¼ in. across, with broad margins of white. Cameroons.

Shepherdi: listed name.

stricta: *Cordyline stricta.*

terminalis: *Cordyline terminalis.*

tricolor: *Cordyline terminalis.*

Veitchii: *Cordyline australis* var.

Victoria: garden form of *D. fragrans.*

Youngii: form of *Cordyline terminalis.*

DRACENA: *Dracæna, Cordyline.*

DRACOCEPHALUM. DRAGONHEAD. *Labiatæ.* Hardy ann. or per. herbs, mostly erect, with entire, toothed or deeply cut lvs. and purple, blue or seldom white 2-lipped fls. in whorls axillary or in terminal spikes. Sometimes grown in borders and flower-gardens.

Dragonheads prefer a rather moist partially shady position and moderately rich sandy loam. Propagated by seeds or by division.

argunense: synonym of *D. Ruyschiana.*

austriacum. Per. to 1½ ft., somewhat hairy: lvs. cleft into 3–5 very narrow revolute lobes: fls. blue, 1½ in. long. Eu., Caucasus.

botryoides. Per. to 6 in., soft-pubescent: lvs. small, ⅓ in. across, round-ovate, deeply 5–7-lobed: corolla pubescent, in whorls that are aggregated into a head. Caucasus.

bullatum. Per. to 10 in., hairy: lvs. cordate-ovate or -elliptic, crenate, to 2 in. long and nearly as broad: fls. bright blue, lower lobe somewhat darker. China.

canariense: *Cedronella canariensis.*

Forrestii. Per. to 1½ ft., leafy: lvs. pinnatisect with 2 or 3 pairs of lobes, or 3-parted, the segms. ¾ in. long, revolute, white-hairy underneath: fls. blue-purple, in whorls. China.

grandiflorum. Per. to 1 ft.: lvs. oblong or ovate, basal lvs. notched at base: fls. blue, hairy, 2 in. long, in spikes to 3 in. long, June–July. Siberia.

Isabellæ. Per. to 2 ft.: lvs. deeply divided into 5–7 linear entire segms. to 1 in. long: fls. purple-blue, to 2 in. long, hairy, in spikes to 4 in. long. China.

japonicum: *D. Ruyschiana* var.

Moldavica (*Moldavica suaveolens*). Ann. to 2 ft.: lvs. lanceolate, to 1½ in. long, toothed: fls. blue or white, 1 in. or less long, in long leafy racemes, July–Aug. Eu., N. Asia.

nutans. Per. to 1 ft.: lvs. ovate or oblong, to 2 in. long, coarsely toothed: fls. bright blue, ½ in. long, sometimes drooping, in spikes to 6 in. long. Cent. Asia.

parviflorum (*Moldavica parviflora*). Ann. or bien. to 2½ ft.: lvs. lanceolate to ovate, to 3 in. long, toothed: fls. light blue, scarcely longer than calyx, in short dense spikes. N. Amer.

peregrinum. Decumbent, branches ascending: lvs. lanceolate, entire or with few teeth: fls. blue, in racemes to 1½ ft. long, July. Siberia.

Ruyschiana. Per. to 2 ft.: lvs. linear-lanceolate, to 2 in. long, entire: fls. blue or bluish and in var. japonicum white shaded with blue, 1 in. long, hairy, in short spikes. Siberia.

speciosum. Per. to 1½ ft.: lvs. orbicular, to 4 in. long, wavy-toothed, pubescent beneath and wrinkled: fls. purplish to deep purple, 1 in. long, hairy, in dense heads, June–July. Himalayas.

tanguticum. To 2 ft.: lvs. pinnatisect into 2–3 pairs of long-linear lobes: fls. blue, 1 in. long, in interrupted spikes. Mongolia.

thymiflorum. Ann., lightly pubescent, sts. erect and simple, to 18 in.: lvs. orbicular-ovate, cordate, serrate or entire: fls. light purplish, in many-fld. whorls forming a long raceme. Eu., Asia.

virginianum: *Physostegia virginiana.*

DRACOPIS: *Rudbeckia amplexicaulis.*

DRACUNCULUS. *Araceæ.* Tuberous herbs native in the Medit. region, bearing pedately dissected lvs. and unisexual fls. on spadices surrounded by spathes; of very offensive odor when in bloom and grown only as a curiosity in the greenhouse or in the open far S.

vulgaris (*Arum Dracunculus*). Lvs. of 13–15 segms. from a bow-shaped base, the petioles about 1 ft. long: spathes with purple limb to 1 ft. long, the tube striped purple.

DRAGONHEAD: *Dracocephalum.* False: *Physostegia.*

DRAGON-ROOT: *Arisæma Dracontium.*

DRAGON-TREE: *Dracæna Draco.*

DRIMYS (*Drymis* is a later spelling). *Magnoliaceæ.* About a dozen aromatic glabrous trees and shrubs in the southern hemisphere: lvs. alternate, bearing pellucid dots: fls. small in ours, solitary or fascicled; petals spreading, 5 or more: fr. of 1 or more indehiscent berries.

axillaris. To 25 ft. or more, with black bark: lvs. narrow-ovate to oblong, to 5 in. long, obtuse, mostly coriaceous, greenish-yellow, the petals linear. New Zeal.; intro. in Calif.

DROPWORT: *Filipendula hexapetala.*

DROSANTHEMUM. *Aizoaceæ.* Segregate from Mesembryanthemum: per., sometimes woody at base, branching and spreading or diffuse, the sts. hispid or rough with small pustules: lvs. small, cylindric or somewhat angled, glistening: fls. solitary, white, rose, violet or reddish; stigmas 4–6. S. Afr. For cult. see *Mesembryanthemum.*

candens (*M. candens*). Sts. or branches to 2 ft. or more, rooting, very slender: lvs. to ½ in. long: fls. small, violet or pinkish, terminating short lateral leafy branches.

floribundum (*M. floribundum*). Branches short, somewhat decumbent: lvs. to about 1 in. or less, cylindrical, obtuse: fls. rose, on peduncles 1 in. or more long.

DROSERA. SUNDEW. *Droseraceæ.* Insectivorous usually per. herbs with basal lvs. covered with glandular hairs, and small white, pink or red fls. in a one-sided raceme terminating the scape; occasionally grown for botanical study and sometimes in rock-gardens; native in moist or swampy places.

The sundews are planted under glass in pots containing moist loam and sphagnum. They require abundant moisture and sunlight. Propagated by seeds, division of shoots and root-cuttings.

filiformis. Lvs. linear and thread-like, to 8 in. long, with purple hairs: fls. bright purple or rarely white, on scapes to 2 ft. high. Mass. to Fla. and Miss.

longifolia. Lvs. with long petioles and spatulate hairy blades to 1¼ in. long: fls. white, on scapes to 1 ft. high. N. Amer., N. Eu., Asia.

rotundifolia. Lvs. with flat petiole and round hairy blades to 1½ in. long: fls. white to red, on scapes to 10 in. high. N. Amer., Eu., Asia.

DROSERACEÆ. SUNDEW FAMILY. Four widely distributed genera of herbs with lvs. in basal rosettes which are glandular-hairy and insectivorous, bisexual fls. having 4–5 sepals, 5 petals, 4–20 stamens, superior 1-celled ovary, and capsular frs. Dionæa and Drosera are sparingly cult.

DRUPE: a fleshy 1-seeded indehiscent fruit, with seed inclosed in a stony endocarp; stone-fruit, as peach, cherry.

DRUPELET: one element in a fruit made up of aggregate little drupes, as in the raspberry.

DRYANDRA. *Proteaceæ.* Shrubs of extratrop. W. Australia, two or more intro. in Calif.: lvs. alternate, mostly sinuate or pinnatifid and sometimes pinnate, often prickly-toothed: fls. in dense heads, mostly yellow, the head sitting in an involucre of scale-like bracts and attended by foliage lvs.: fr. a caps., usually hairy.

floribunda. Bush to 8 ft.: lvs. nearly or quite sessile, cuneate or obovate, undulate and prickly, mostly less than 1 or 2 in. long: fl.-heads small, terminal, involucre not ½ in. long; fls. nearly 1 in. long, silky.

formosa. Erect shrub to 15 ft.: lvs. to 8 in. long, divided to midrib: fl.-heads large, terminal, involucre to 1½ in. diam.; fls. to 1½ in. long, more or less silky.

DRYAS. *Rosaceæ.* Evergreen creeping plants somewhat shrubby at base, with alternate lvs., white or yellowish solitary showy fls., and fr. an achene with feathery style or tail; native in high northern parts of northern hemisphere and on mts., suitable for rock-gardens; they make a rather close ground-cover and send up peduncles a few inches high. Propagated by cuttings, division, or seed.

Drummondii. Lvs. oblong, to 1½ in. long, white-tomentose beneath: fls. yellowish, about ¾ in. across, nodding: fruiting styles to 1½ in. long. N. N. Amer.

lanata: woolly-lvd. form of *D. octopetala*, from S. Eu.

octopetala. Lvs. elliptic or oblong, to 1 in. long, white-tomentose beneath: fls. white, 1–1½ in. across, erect: fruiting styles 1 in. long. N. N. Amer., N. Eu., N. Asia.

Suendermanni. Hybrid between *D. octopetala* (staminate) and *D. Drummondii:* fls. yellowish in bud, white in full bloom and nodding.

DRYMIS: *Drimys.*

DRYMOCALLIS: *Potentilla.*

DRYMOPHLŒUS: D. Normanbyi is *Normanbya Normanbyi;* **D. singaporensis** is *Ptychoraphis.* The genus Drymophlœus is retained for other species, but is not known to be represented in the U. S.

DRYNARIA: *Polypodium.*

DRYOPTERIS (*Lastrea. Nephrodium. Thelypteris. Aspidium* in part). Wood-Fern. *Polypodiaceæ.* Both temp. and trop. ferns with compound foliage; sori borne on veins with or without indusia. Many of them are woodsy plants native in the U. S. and Canada and are sometimes transferred to grounds. The greenhouse species require no special treatment. See *Ferns.*

acrostichoides: *Polystichum acrostichoides.*

aculeata: *Polystichum aculeatum.*

arguta: see *D. rigida.*

Boottii (*Aspidium Boottii*). Lvs. to 2½ ft. long and 5 in. wide, 2–3-pinnate, segms. finely toothed. N. S. to Minn. and Va.; probably a hybrid between *D. cristata* and *D. spinulosa* var. *intermedia.*

chrysoloba. Lvs. to 9 in. long and 4 in. wide, 2-pinnate, segms. entire. Brazil, Colombia.

Clintoniana: *D. cristata* var.

cristata (*Aspidium cristatum*). Lvs. to 2½ ft. long and 6 in. wide, 2-pinnatifid, segms. finely toothed. Newf. to Va. and Neb., Eu., Asia. Var. **Clintoniana** (*D. Clintoniana*) has broader lvs.

decomposita. Lvs. to 1½ ft. long and 1 ft. wide, 2–3-pinnate, segms. toothed, pubescent. New Zeal., Australia.

dentata (*D. mollis. D. parasitica. Aspidium violescens*). Downy W. Lvs. to 3 ft. long and 1 ft. wide, 1-pinnate, the segms. pinnatifid and entire, hairy. Tropics.

dilatata: *D. spinulosa* var.

Dryopteris: *D. Linnæana.*

erythrosora. Lvs. to 1½ ft. long and half as wide, 1-pinnate, segms. pinnatifid, toothed: fruit-dots red when young. China, Japan.—Some of the material cult. as *D. chrysoloba* belongs here.

Filix-mas (*Aspidium Filix-mas*). Male-Fern. Lvs. growing in crowns, nearly evergreen, to 4 ft. long and 1 ft. wide, 2-pinnate, segms. toothed or cut. N. Amer., Eu.—There are crisped, crested, forked, dwarf forms.

Goldiana (*Aspidium Goldianum*). Goldie-Fern. Lvs. in large crowns, to 4 ft. long and 1½ ft. wide, 2-pinnate, segms. toothed, dark green above. N. B. to N. C. and Tenn.

hexagonoptera (*Polypodium hexagonopterum. Phegopteris hexagonoptera*). Winged W. Lvs. triangular, to 15 in. long and broad, 1-pinnate into pinnatifid wavy-toothed segms.; sori without indusia. Que. to Fla. and La.

hirtipes. Lvs. stiff, to 3 ft. long and 16 in. wide, 1-pinnate into segms. cut one-third to midrib, stalks black-scaly. India.

intermedia: *D. spinulosa* var.

Linnæana (*Phegopteris* and *Polypodium Dryopteris*). Oak-Fern. Lvs. triangular, to 11 in. each way, 2-pinnate, segms. entire or wavy-toothed; sori without indusia. N. N. Amer., Eu., Asia.

marginalis (*Aspidium marginale*). Leather W. Lvs. in crowns, to 2½ ft. long, 2-pinnate, segms. entire or lobed. N. S. to Ga. and Kans.

mollis: *D. dentata.*

noveboracensis (*Aspidium noveboracense*). New-York-Fern. Lvs. pale green, to 2 ft. long and 7 in. wide, 1-pinnate, segms. deeply pinnatifid. Newf. to Ga. and Ala.

oreopteris (*Polystichum montanum*). Mountain W. Lvs. to 3 ft. long and 8 in. wide, 1–2-pinnate, segms. nearly entire. Wash. to Alaska, Eu., Japan.

parasitica: *D. dentata.*

pennigera (*Polypodium pennigerum*). Lvs. to 5 ft. long and 1½ ft. wide, 1-pinnate into deeply cut nearly entire segms. New Zeal., Polynesia.

Phegopteris (*Polypodium Phegopteris. Phegopteris polypodioides*). Long or Narrow Beech-Fern. Lvs. triangular, to 9 in. long and 8 in. wide, 1-pinnate into deeply pinnatifid nearly entire segms.; sori without indusia. N. N. Amer., Eu., Asia.

rigida (*Aspidium rigidum*). Lvs. to 2 ft. long and 1 ft. wide, 2-pinnate, segms. toothed or cut. Eu., W. N. Amer.—The American plant is separated as *D. arguta.*

Robertiana (*Phegopteris Robertiana*). Northern Oak-Fern. Scented Oak-Fern. Limestone Polypody. Stalks and lvs. minutely glandular beneath, lvs. to 8 in. long and 7 in. wide, 2–3-pinnatifid; sori without indusia. N. N. Amer., Eu.

spinulosa (*Aspidium spinulosum*). Toothed W. Lvs. to 1½ ft. long and 9 in. wide, 2-pinnatifid into deeply cut segms. N. Amer., Eu., Asia. Var **intermedia** (*D. intermedia*) has indusia with marginal glands. Var. **dilatata** has 3-pinnate lvs.

Thelypteris (*Aspidium Thelypteris. Thelypteris palustris*). Marsh-Fern. Rootstock creeping: lvs. to 2½ ft. long and 6 in. wide, 1-pinnate into deeply pinnatifid segms., margins revolute. N. Amer., Eu., Asia.

viridescens. Glossy W. Lvs. to 2 ft. long, 3-pinnate, segms. toothed, stalks shining. Japan.

DUCHESNEA. Indian- or Mock-Strawberry. *Rosaceæ.* Asian per. herbs with trailing often rooting branches, long-stalked 3-parted lvs., yellow solitary fls., and fr. composed of achenes borne on a dryish receptacle; used as ground-cover and for hanging baskets.

indica (*Fragaria indica*). Lfts. ovate, coarsely toothed: fls. ½–1 in. across: fr. red, surrounded by large persistent calyx. India; nat. in N. Amer.—Looks like a strawberry.

DUCKWEED: *Lemna.*

DUCKWHEAT: *Fagopyrum tataricum.*

DUDLEYA. *Crassulaceæ.* Succulent perennials related to Cotyledon and Echeveria, native from Ore. to Lower Calif. and Ariz., mostly near the coast: with or without erect fl.-sts., usually not making offsets: lvs. flat, linear to ovate, forming prominent basal clumps or rosettes, the st.-lvs. smaller and sessile or clasping: fls. commonly in panicles, yellow, orange, red, or seldom white; corolla nearly cylindric, the segms. united below the middle and the tips erect or spreading. Useful and attractive plants, of some 60 species, for colonizing, in the regions in which they grow.

cæspitosa (*Cotyledon cæspitosa*). Stemless, green or perhaps glaucous: lvs. ovate-oblong to nearly lanceolate, to 3 in. or more long, in mostly rather loose rosettes, those on scapes more or less triangular and small: fls. yellow or pale, about ½ in. long, in cyme on scapes to 1½ ft. or more high. Calif.

densiflora: *Stylophyllum densiflorum.*

farinosa (*Cotyledon* and *Echeveria farinosa*). Sts. low, rootstock short: basal lvs. tongue-shaped, flat and white-mealy; st.-lvs. sagittate: fls. lemon-yellow, on slender pedicels in rather open cymes. Coasts, Calif.

lanceolata (*Cotyledon* and *Echeveria lanceolata*). Green or somewhat glaucous: fl.-sts. to 2 ft.: basal lvs. lanceolate and long-acuminate, to 6 in. long; st.-lvs. cordate or sagittate: fls. reddish-yellow, about ½ in. long. S. Calif.

laxa (*Cotyledon* and *Echeveria laxa*). Glaucous or yellowish-green: fl.-sts. to 2 ft.: lvs. ovate to lanceolate, acute, to about 3 in. long: fls. yellow, deeply parted, ½ in. long, in loose lax cyme. S. and Cent. Calif.

lurida (*Cotyledon lurida*). Not glaucous, lvs. becoming bronzed: fl.-sts. to 20 in., purplish: lvs. lance-acuminate, to 6 in. long: fls. reddish, to about ½ in. long, in panicles. S. Calif.

Plattiana (*Cotyledon Plattiana*). Somewhat glaucous: fl.-sts. to 8 in. long: lvs. oblanceolate, to 4 in. long: fls. reddish, about ⅓ in. long, in short somewhat flat-topped infl. Cent. Calif.

pulverulenta (*Cotyledon* and *Echeveria pulverulenta*). Mealy all over: fl.-sts. to 2½ ft.: lvs. broadly spatulate, to 3½ in. long, those on st. broadly ovate and clasping: fls. red, above ½ in. long, in racemes. S. Calif.

septentrionalis. White-powdery: fl.-sts. about 3 in. long: lvs. in compact rosettes, ovate, 1 in. broad: fls. pale yellowish-green, short and broad, in a very compact cyme. N. Calif.

DUGALDIA: *Helenium Hoopesii.*

DUGGENA. *Rubiaceæ.* Shrubs or small trees with opposite lvs., small salverform fls. in terminal spikes, racemes or panicles, and berry-like frs.; one species intro. in S. Calif.

hirsuta (*D. spicata*). To 10 ft.: lvs. ovate to lanceolate, to 7 in. long, pubescent or becoming glabrous: fls. white, ½ in. long, in spike-like panicles to 16 in. long: fr. white or blue. W. Indies, N. S. Amer.

spicata: *D. hirsuta.*

DURANTA. *Verbenaceæ.* Shrubs and trees with opposite or whorled lvs., small fls. in terminal racemes, and drupe-like frs.; one species (*D. repens*) is commonly planted in warm regions and sometimes under glass. Propagated by seeds and cuttings in spring.

Lorentzii. Shrub to 10 ft. with drooping branches: lvs. ovate, small and leathery, toothed toward apex: fls. white. Argentina.

Plumieri: *D. repens.*

repens (*D. Plumieri*). PIGEON-BERRY. SKY-FLOWER. Shrub or tree to 18 ft., sometimes spiny and often with drooping or trailing branches: lvs. ovate to obovate, to 4 in. long, entire or coarsely toothed: fls. lilac, to ½ in. across: fr. yellow, to ½ in. across. Fla. to Brazil. Var. **alba** has white fls. and **variegata** variegated lvs.

stenostachya. Shrub to 15 ft.: lvs. oblong-lanceolate, to 8 in. long, entire or toothed: fls. lilac, ½ in. across: fr. yellow, ⅓ in. across. Brazil.

DURIAN: *Durio.*

DURIO. *Bombacaceæ.* Malayan trees with entire leathery lvs., fls. in cymes, and large spiny frs.

The durian is grown sparingly in the western tropics, not being hardy in continental United States. It does best in deep rich soil with plenty of moisture. Propagated by seeds, and superior strains by budding on seedling stocks.

zibethinus. DURIAN. To 80 ft.: lvs. obovate-oblong, to 7 in. long: fls. whitish: fr. oval, to 8 in. long, with custard-like pulp of disagreeable odor.

DURRA: *Holcus Sorghum* var. *Durra.*

DUSTY MILLER: *Artemisia Stelleriana, Centaurea Cineraria* and *gymnocarpa, Lychnis Coronaria, Senecio Cineraria* and *leucostachys.*

DUTCHMANS-BREECHES: *Dicentra Cucullaria.*

DUTCHMANS-PIPE: *Aristolochia durior.*

DUVALIA. *Asclepiadaceæ.* Succulent little leafless herbs in Afr., one or more intro. in Calif. and perhaps elsewhere: sts. thick and angled, teeth tipped: fls. near base or middle of young sts., mostly in small clusters; corolla rotate and deeply 5-lobed; corona double.

Corderoyi (*Stapelia Corderoyi*). Sts. 1¼ in. or less long from one crown, oblong or nearly globose, tinged purple in sun: fls. 2 to 4, olive-green with darker tips and bearing purple hairs toward base, to 2 in. diam.; outer corona brick-red, inner one buff. S. Afr.

DYCKIA. *Bromeliaceæ.* Stemless succulent or thick herbs with stiff spiny-margined lvs. in basal rosettes and yellow or orange fls. in racemes or panicles; native in S. Amer. and occasionally planted in Fla. or Calif. Cult. as for *Bromeliaceæ.*

rariflora. Lvs. to 6 in. long and ⅙ in. wide: fls. orange, ⅓ in. long, the infl. to 1½ ft. Brazil.

sulphurea. Lvs. to 8 in. long and ¾ in. wide: fls. yellow, ⅓ in. long, the infl. to 1 ft. high. Brazil.

DYERS-GREENWEED: *Genista tinctoria.*

DYPSIS: see *Chrysalidocarpus madagascariensis.*

DYSCHORISTE (*Calophanes*). *Acanthaceæ.* Per. Ruellia-like herbs widely distributed in warm regions: lvs. opposite, entire: fls. irregular, bracted, in cymes.

linearis. To 1½ ft.: lvs. linear to spatulate, to 2½ in. long: fls. violet spotted with purple, 1 in. long. Tex. to N. Mex.—Sometimes transferred to grounds.

DYSOXYLUM. *Meliaceæ.* Large trees of which one has been intro. into Calif. for ornament, native from trop. Asia to New Zeal.: lvs. alternate, pinnate: fls. in loose axillary panicles: fr. a leathery caps.

spectabile. To 50 ft.: lvs. of 3–4 pairs of ovate-oblong entire lfts. to 7 in. long: fls. waxy-white, 1½ in. across, in drooping panicles to 1½ ft. long: caps. 1 in. long. New Zeal.

E

EASTER BELLS: *Stellaria Holostea.*

EBENACEÆ. Ebony Family. Trees or shrubs of some 6 genera in warm and temp. regions of both hemispheres, with very hard wood, alternate entire lvs., regular unisexual or bisexual gamopetalous fls. having prominent 3–7-lobed calyx and corolla, 2–3 times as many stamens as corolla-lobes, superior ovary with 2–8 styles, and fr. a berry. Diospyros is grown for the edible frs. of some species and for the ornamental character of others, and Maba and Royena for ornament.

EBENUS. *Leguminosæ.* About a score of herbs or subshrubs of E. Medit. region and W. Asia, one of which is intro. in Calif.: lvs. simple, digitate, or odd-pinnate: fls. papilionaceous, in colored clover-like heads: pod small and included in the calyx, seeds 1 or 2. **E. cretica** is somewhat shrubby, to 2 ft.: lfts. 3 or more, narrowly oblong: heads more or less cylindrical, red or purplish. Crete. See *Maba.*

EBONY FAMILY: *Ebenaceæ.*

EBONY, MOUNTAIN: *Bauhinia variegata.*

ECBALLIUM. *Cucurbitaceæ.* One monœcious per.-rooted herb of the Medit. region, more or less trailing or prostrate but without tendrils, planted sometimes for the interest of its odd frs.: fls. yellow, pistillate solitary, staminate racemose. It grows readily from seeds. **E. Elaterium** (*Momordica Elaterium*). Squirting-Cucumber. Hairy-pubescent and grayish: lvs. triangular-ovate, to 4 in. long, angled or obscurely lobed: fr. oblong, to 2 in. long, rough-hairy, squirting the seeds when detached.

ECCREMOCARPUS (*Calampelis*). Glory-Flower. *Bignoniaceæ.* Climbing shrubs from Peru and Chile with pinnate lvs. terminated by a branching tendril, tubular yellow, orange or scarlet fls. in terminal racemes, and fr. an ovoid caps.; grown as an ann. in the N. and per. where it is hardy.

scaber. Woody, climbing to 12 ft. but sometimes treated as an herb and blooming first year from seed: lvs. 2-pinnate into ovate entire or toothed lfts. to 1¼ in. long: fls. orange-red, 1 in. long, in racemes to 6 in. long, with small lobes: fr. 1½ in. long. Chile. Var. **aureus** has golden-yellow fls., **carmineus** carmine-red, and **coccineus** scarlet.

ECHEVERIA. *Crassulaceæ.* American succulents with broad lvs. in rosettes and fls. in spikes, racemes or panicles, the strongly angled corolla with short tube that little if at all exceeds the calyx. By some authors the genus is included in Cotyledon. For cult. see *Sempervivum* and *Succulents;* grown in pots and frequently planted out. The plants have the habit of Sempervivums.

agavoides: *Urbinia agavoides.*

Cooperi: presumably *Cotyledon Cooperi.*

farinosa: *Dudleya farinosa.*

gibbiflora (*Cotyledon gibbiflora*). To 2 ft.: lvs. obovate-spatulate, to 7 in. long, becoming pinkish: fls. red. Mex. Var. **metallica** has glaucous-purple foliage with metallic luster.

glauca (*E. secunda* var. *glauca*). Lvs. nearly orbicular, ¾ in. across, pale and glaucous, with purple point: fls. pinkish outside, yellow inside, the flowering branches reddish. Mex.

Hoveyi (*Cotyledon Hoveyi*). Nearly stemless, but fls. on an elongated peduncle or scape: lvs. long-spatulate forming a basal rosette, margined: fls. 6–12, racemose, pinkish. Origin unknown; perhaps a cultigen.

lanceolata: *Dudleya lanceolata.*

laxa: *Dudleya laxa.*

metallica: *E. gibbiflora* var.

multicaulis. To 3 ft.: lvs. to 8 in. long and ¾ in. wide: fls. reddish, yellowish inside, the flowering branches rose-colored. Mex.

pulverulenta: *Dudleya pulverulenta.*

secunda (*Cotyledon secunda*). Lvs. obovate, with very short sharp point, glaucous-blue, reddish at margins: fls. reddish, on scapes to 15 in. tall. Mex.

Weinbergii: *Byrnesia Weinbergii.*

ECHIDNOPSIS. *Asclepiadaceæ.* Leafless succulent plants of trop. Afr. and Arabia allied to Stapelia, the stout branching sts. tubercled: fls. fleshy, 5-lobed, yellow or purple-brown, small, in fascicles or sometimes solitary. **E. Dammanniana** is offered: sts. to ¾ in. thick, grayish-green or purplish-green, 8–10-angled: fls. 2–5 together or solitary; corolla dark purple-brown, about ⅓ in. across. Nile Land.

ECHINACEA (*Brauneria*). Coneflower. *Compositæ.* N. American coarse herbaceous perennials with thick black roots of pungent taste and alternate simple lvs.: heads large and showy, solitary and terminal, ray-fls. purple or rose or yellow, disk-fls. green or purple, becoming conical; pappus a short crown.

The coneflowers are easily cultivated in the border or wild-garden. Propagated by division but this should not be practiced too frequently; also by seed.

angustifolia. To 2 ft., hairy: lvs. lanceolate or linear-lanceolate, to 8 in. long, entire: heads light purple, rays about 1 in. long, spreading, the fruiting disk often 1 in. high. Sask. to Tex.

pallida (*Rudbeckia pallida*). To 3 ft., hairy: lvs. linear-lanceolate, to 8 in. long, entire: heads rose-purple to nearly white, rays to 3 in. long, drooping. Ill. to Tex.

purpurea (*Rudbeckia purpurea*). Purple C. To 5 ft.: lvs. ovate or ovate-lanceolate, to 8 in. long, usually toothed: heads purple varying to white, rays to 3 in. long, spreading or drooping. Pa. to Ga. and La.

ECHINOCACTUS. *Cactaceæ.* More than 1,000 names have been applied in this genus, but it is now restricted to about 9 species: plants thick, sometimes very large, many- or several-ribbed, cylindric, the large areoles very spiny: fls. on the crown, yellow or pink, often immersed in wool; axils of scales on ovary and fr. woolly: fr. white-woolly. S. W. U. S. and Mex. See *Cacti*.

Various kinds of echinocacti and closely related genera are favorites for pot and tub culture and for plunging in the open in summer. They are propagated by seeds as they do not branch nor readily produce offsets. Seeds are sown in late spring or early summer. Under glass they may require pollination to produce seeds. In winter, the plants may be placed in a light dry greenhouse and kept fairly dormant; in spring and summer water may be supplied liberally to established plants.

acanthodes: *Ferocactus acanthodes.*

albatus: of doubtful application in the trade.

anfractuosus (*Echinofossulocactus anfractuosus*). Simple, 4–5 in. tall and half as thick, dull green, ribs many, radial spines 7 and central solitary, curved: fls. purple, segms. white-margined. Mex.

Beguinii: *Neolloydia Beguinii.*

bicolor: *Thelocactus bicolor.*

capricornis: *Astrophytum capricorne.*

conoideus: *Neolloydia conoidea.*

coptonogonus (*Echinofossulocactus coptonogonus*). Perhaps cespitose, globular or somewhat depressed, to 4 in. high, ribs 10–14, spines 3–5 and stout: fls. about 1 in. long and broader when open, purple, segms. white-margined. Mex.

crispatus (*Echinofossulocactus crispatus*). Obovoid and somewhat depressed at apex, 5 in. or more high, ribs about 25, spines 10 or 11 and rigid: fls. rather small, purple or white with purple stripes. Mex.

cylindraceus: *Ferocactus acanthodes.*

denudatus: *Gymnocalycium denudatum.*

disciformis: *Strombocactus disciformis.*

gibbosus: *Gymnocalycium gibbosum.*

glaucescens: *Ferocactus glaucescens.*

Grusonii. A few inches to 4 ft. or more high, to 2½ ft. diam., light green, ribs 21–37, spines golden-yellow when young but becoming whitish, the radials 8–10: fls. yellow, brownish outside, imbedded in a felt-like cushion, opening in sunlight. Cent. Mex.

hamatacanthus: *Ferocactus hamatacanthus.*

heteracanthus (*E. tetraxiphus. Echinofossulocactus heteracanthus*). Globose or short-cylindric, light green, closely covered with spines, ribs 30–34, radials 11–13, centrals 4: fls. greenish-yellow. Mex.

heterochromus: *Thelocactus Pottsii.*

hexædrophorus: *Thelocactus hexædrophorus.*

horizonthalonius. Not large, globular or short-cylindric, to 10 in. high, glaucous, ribs commonly 8, spines 6–9 and to 1½ in. long and reddish or blackish at base, central solitary: fls. pale rose or pink, 2 in. or more long and of greater breadth when expanded. W. Tex. to Ariz. and Mex.

humilis: doubtful name in the lists.

ingens. To 5 ft. high and 4 ft. diam., more or less short-oblong, somewhat glaucous and purplish, woolly at top, ribs 8, spines brown, 8 radial, 1 central: fls. ¾ in. long and somewhat broader, yellow. Mex.

intertextus: *Echinomastus intertextus.*

intortus: *Melocactus intortus.*

Johnsonii: *Ferocactus Johnsonii.*

Krausei: dubious name.

latispinus: *Ferocactus latispinus.*

Lecontei: *Ferocactus Lecontei.*

Leninghausii: *Malacocarpus Leninghausii.*

leucacanthus: *Thelocactus leucacanthus.*

longihamatus: *Ferocactus hamatacanthus.*

lophothele: *Thelocactus lophothele.*

Macdowellii: *Echinomastus Macdowellii.*

mammulosus: *Malacocarpus mammulosus.*

melocactiformis: *Ferocactus melocactiformis.*

minusculus: *Rebutia minuscula.*

Mostii: *Gymnocalycium Mostii.*

multicostatus (*Echinofossulocactus multicostatus*). Simple, mostly globose and sometimes depressed, 2–4 in. diam., ribs 100 or more, spines usually 6–9: fls. 1 in. long, white with broad purple stripe. Mex.

multiflorus: *Gymnocalycium multiflorum.*

myriostigma: *Astrophytum myriostigma.*

ornatus: *Astrophytum ornatum.*

Ottonis: *Malacocarpus Ottonis.*

peninsulæ: *Ferocactus peninsulæ.*

pilosus: *Ferocactus Stainesii.*

polycephalus. Rather small, at length forming clumps, body globular or short-cylindric and sometimes 2 ft. tall, ribs 13–21, spines many and covering the plant, radials 7–15, centrals 4: fls. yellow, 2 in. or more long. Utah, Nev., Ariz., Calif., Mex.

Pottsii: *Thelocactus Pottsii.*

robustus: *Ferocactus robustus.*

Schickendantzii: *Gymnocalycium Schickendantzii.*

setispinus: *Hamatocactus setispinus.*

Simpsonii: *Pediocactus Simpsonii.*

Stainesii: *Ferocactus Stainesii.*

submammulosus: *Malacocarpus mammulosus.*

tabularis: *Malacocarpus tabularis.*

tetraxiphus: *E. heteracanthus.*

texensis: *Homalocephala texensis.*

turbiniformis: *Strombocactus disciformis.*

uncinatus: *Ferocactus uncinatus.*

unguispinus: *Echinomastus unguispinus.*

viridescens: *Ferocactus viridescens.*

viridiflorus: *Echinocereus viridiflorus.*

Visnaga. Large, to 10 ft. high and 3 ft. or more diam., glaucous-green, tawny-woolly on top, ribs 15–40, spines 4 and all radial: fls. yellow, about 3 in. long. Mex.

Whipplei: *Sclerocactus Whipplei.*

Williamsii: *Lophophora Williamsii.*

Wislizeni: *Ferocactus Wislizeni.*

ECHINOCEREUS. *Cactaceæ.* Sts. solitary or cespitose and forming large clumps, erect or prostrate, always low, sometimes pendent, globular to cylindric, mostly spiny or bristly, ovary and fr. spiny: fls. diurnal but not always closing at night, bell-shaped to funnelform, scarlet, purple, yellow. About 60 species in W. U. S. and Mex. See *Cacti*.

The echinocereuses are more or less grown in collections but are not generally useful for greenhouse conditions although the bloom is showy. The plants are likely not to last many years, and they may be renewed from the wild or from the stock of regular dealers.

acifer (*Cereus acifer*). Sts. clustered, 6–8 in. high and to 2 in. diam., glossy-green, ribs prevailingly 10, radial spines 5–10, centrals mostly 4: fls. scarlet, 2 in. and more long. Mex.

aggregatus: *Coryphantha aggregata.*

Baileyi. Cylindric, about 4 in. high, ribs 15, radials about 16 and first white then brownish or yellowish, no centrals: fls. about 2½ in. broad, light purple inside and segms. erose or toothed. Okla.

Berlandieri: *E. Blanckii.*

Blanckii (*Cereus Blanckii. E.* and *Cereus Berlandieri*). Prostrate and branching from the base making a colony of erect or ascending sts. to 6 in. long and 1 in. diam., ribs 5–7, radial spines 6–8, central solitary: fls. purple, to 3 in. and more long. S. Tex., Mex.

cæspitosus: *E. Reichenbachii.*

chloranthus (*Cereus chloranthus*). Usually simple, sts. cylindric to 6 in. long and 2–3 in. diam., very spiny, ribs about 13, radials several, centrals 3 or 4: fls. yellowish-green, ¾ in. long. W. Tex., New Mex. and Mex.

cinerascens (*Cereus cinerascens*). Making patches 2–4 ft. across, sts. ascending 1 ft., ribs about 12, spines pale or white, radials about 10, centrals 3 or 4: fls. about 3 in. long, purple inside, tube with white wool. Mex.

coccineus (*Cereus coccineus. C. phœniceus. C. Roemeri*). Mostly densely cespitose, forming mounds, sts. 6–8 in. high, 1–2 in. diam., ribs 8–11, radials 8–12 and needle-like and commonly white, centrals several and straight and terete: fls. 2 in. or more long, crimson. Colo., Utah, New Mex., Ariz.

conglomeratus (*Cereus conglomeratus*). In large clumps, sts. 4–8 in. long and often partly in the ground, ribs 11–13, radials needle-like, centrals several: fls. 2 in. or more long, purplish. Mex.

conoideus (*Cereus conoideus*). Cespitose; like *E. coccineus* but central spines somewhat curved and more or less angled. W. Tex., Mex.

ctenoides (*Cereus ctenoides*). Sts. cylindric, to 16 in. long and 3–4 in. diam., ribs 15–17, radial spines to 20 and not spreading, centrals 8–10: fls. 3–4 in. long, wide-expanding, bright or reddish-yellow. S. Tex., Mex.

dasyacanthus (*Cereus dasyacanthus*). St. cylindric, 4–12 in. high, very spiny, ribs 15–20, radials 16–24 and pinkish at first, centrals 3–8: fls. to 4 in. long, yellow. W. Tex., New Mex., Mex.

dubius (*Cereus dubius*). Somewhat cespitose, sts. to 8 in. long, soft, pale green, white-spined, ribs 7–9, radials 5–8, centrals 1–4: fls. 2½ in. or more long, pale purple. S. W. Tex.

Emoryi: *Bergerocactus Emoryi.*

Engelmannii (*Cereus Engelmannii*). In large clumps, sts. cylindric, 4–12 in. long and 2 in. or more diam., ribs 11–14, radial spines about 10, centrals 5 or 6: fls. 2–3 in. long, widely expanding, purple. Utah, Nev., S. Calif., Ariz., Mex.

enneacanthus (*Cereus enneacanthus*). Cespitose, sts. ascending and 3–5 in. long and 2 in. diam. more or less, ribs 7 or 8, radials mostly 8, central solitary: fls. to 2½ in. long, purple. S. Tex., New Mex., Mex.

Fendleri (*Cereus Fendleri*). Cespitose but with few sts. which are ascending or erect and 4–12 in. long and 2–3 in. diam., ribs 9–12, radials 5–10, central solitary: fls. to 4 in. broad in expansion, deep purple. Utah, Ariz., Tex., Mex.

Fitchii. Plant body cylindric or narrowed to top, to 4 in. high and half as thick, the ribs 10–12, radials about 20: fls. pink, to nearly 3 in. long, widely spreading. Tex.

Knippelianus. About 4–8 in. high, thick, branching, deep green, ribs 5–7, spines 1–3 and weak: fls. about 1 in. long, pinkish. Mex.

mamillatus (*Cereus mamillatus*). Cespitose, sts. 8–12 in. long, cylindric, 1½ in. or more diam., ribs 20–25, radials 10–25, central spines 3 or 4: fls. not described. Lower Calif.

Merkeri. Cespitose, parts erect, to 6 in. diam., light green, ribs 8 or 9, radial spines 6–9 and white, centrals 1 or 2: fls. 2 in. or more long, purple. Mex.

mojavensis (*Cereus mojavensis*). Forming great clumps, sts. globose to oblong to 8 in., pale green, ribs 8–13, radials about 10, central spine solitary: fls. to nearly 3 in. long, crimson. Utah, Nev., Calif., Mex.

octacanthus (*Cereus octacanthus*, and *C. Roemeri* of some lists). Cespitose, joints or sts. ovoid to 4 in. long and nearly 3 in. diam., ribs 7–9, radials 7 or 8, central solitary: fls. 2 in. long, red. Tex., perhaps westward.

papillosus (*E. texensis* of some lists). Somewhat cespitose, dark green, sts. to 12 in. long and to 1½ in. diam., ribs 6–10, radials about 7 and needle-like, central solitary: fls. 4 in. or more broad, yellow. W. Tex.

paucispinus: *E. triglochidiatus.*

pectinatus (*Cereus pectinatus*). Simple, cylindric, 4–6 in. long, 1–2 in. diam., with many interlocking spines, ribs 20–22, radials about 30, centrals several: fls. 2–3 in. long, purplish. Mex.

pentalophus (*Cereus pentalophus. C. procumbens*). Procumbent, branches ascending to 5 in. and deep green, ribs 4–6, radials 4 or 5 and very short, central solitary or absent: fls. 3–5 in. long, reddish-violet. S. Tex., Mex.

phœniceus: *E. coccineus.*

polyacanthus (*Cereus polyacanthus*). Cespitose, pale green sometimes tinged red, ribs mostly 10, radial spines about 12, centrals 4: fls. 2 in. or more long, crimson. New Mex., Ariz., Mex.

Poselgeri: *Wilcoxia Poselgeri.*

Reichenbachii (*Cereus Reichenbachianus. C.* and *E. cæspitosus. C. texensis*). Somewhat cespitose, sts. globose or short-cylindric, to 8 in. long and 3 in. diam., ribs 12–19, radials 20–30, centrals 1 or 2: fls. 2–3 in. long, light purple, fragrant. Tex., Mex., perhaps Kans.

rigidissimus. Rainbow Cactus. Simple, erect and rigid, short-cylindric, 4–8 in. high and 4 in. diam., covered with interlocking spines, ribs 18–22, radials about 16, no centrals: fls. 2–3 in. long, purple. Ariz., Mex.

stramineus (*Cereus stramineus*). Forming mounds 1–3½ ft. high, joints to 10 in. long and 1–3 in. diam., ribs about 13, radials 7–14, centrals 3 or 4: fls. 3-nearly 5 in. long, purple. W. Tex., New Mex., Mex.

texensis: *E. Reichenbachii, E. papillosus.*

triglochidiatus (*Cereus triglochidiatus. C. paucispinus*). Cespitose, sts. to 2 ft. long and 3 in. diam., ribs 5–8, spines 3–8 and often all radial: fls. 2 in. long more or less, scarlet. W. Tex., New Mex., Colo.

tuberosus: *Wilcoxia Poselgeri.*

viridiflorus (*Cereus* and *Echinocactus viridiflorus*). Small, nearly globular or cylindric, to 8 in. high, ribs 14, radials about 16, centrals 2 or 3 or wanting: fls. about 1 in. long, greenish. S. D. and Wyo. to Tex.

ECHINOCHLOA. *Gramineæ.* Tall coarse ann. or per. grasses with broad lvs. and spikelets in spike-like racemes borne in large terminal panicles; native in warm regions and grown for forage and grain. See *Grasses.*

Crus-galli (*Panicum Crus-galli. P. Crus-Corvi*). Barnyard-Grass. Ann. to 4 ft.: lvs. to 2 ft. long and 1 in. wide: panicles to 8 in. long, awned. Eu., but widely distributed elsewhere. Var. **edulis** (*E. frumentacea, Panicum frumentaceum*), Japanese Barnyard Millet, has denser panicles and purplish awnless spikelets.

frumentacea: *E. Crusgalli* var. *edulis.*

ECHINOCYSTIS (incl. *Marah*). *Cucurbitaceæ.* Ann. and per. tendril-climbing monœcious vines of N. and S. Amer., with lobed or angled lvs. and small white or greenish fls., the staminate racemose or paniculate and the pistillate solitary. One ann. species, grown from seeds, is frequently planted for covering arbors and fences.

lobata (*Micrampelis lobata*). Wild- or Mock-Cucumber. Essentially glabrous ann., slender, to 20 ft. or more: lvs. sharply 3- to 5-lobed: staminate fls. in long prominent profuse clusters: fr. a papery puffy spiny pod to 2 in. long. N. B. to Ida. and Tex.

macrocarpa. Chilicothe. Monœcious per. from very large thick root: st. to 20 ft.: lvs. more or less circular in outline, several-lobed, to 8 in. across: fls. clear white, staminate in racemes or panicles, pistillate solitary: fr. oblong, spiny, to 4 in. long. S. Calif., and sometimes planted there.

ECHINOFOSSULOCACTUS. A good number of Mexican cacti, many of them imperfectly understood, allied to Echinocactus, in which genus the cult. kinds have also been named and where they will be found in this book. In Echinocactus the axils of the scales on the ovary and fruit are woolly or hairy, whereas in Echinofossulocactus they are naked, and there are other differences.

ECHINOMASTUS. *Cactaceæ.* A half dozen globular or short-cylindric ribbed cacti allied to Echinocactus and with the appearance of Coryphantha; axils of scales on ovary and fr. naked, all or most of the spines needle-like; fls. purple, rose or reddish. See *Cacti.*

intertextus (*Echinocactus intertextus*). Simple, nearly or quite globular, to 4 in. diam., ribs 13, radial spines 16–25 and appressed and upper ones nearly or quite white, centrals 4: fls. about 1 in. long, purple. S. W. Tex., Ariz., Mex.

Macdowellii (*Echinocactus Macdowellii*). Simple, globular or somewhat depressed, nearly 3 in. high, more in diam., ribs 20–25, radials 15–20 and white, centrals 3 or 4 and dark: fls. to 1½ in. long, rose-purple. N. Mex.

unguispinus (*Echinocactus unguispinus*). Simple and usually globular but sometimes short-cylindric, to 4 or 5 in. high, pale bluish-green, spines almost hiding body, radials often 25, centrals 4–8: fls. 1 in. long, reddish. Mex.

ECHINOPANAX. *Araliaceæ.* A few prickly deciduous shrubs native in W. N. Amer. and E. Asia, with alternate palmately 5–7-lobed lvs. and greenish-white fls. in panicled umbels. Propagated by seeds, suckers, and root-cuttings.

horridum. Devils-Club. To 12 ft.: lvs. orbicular-ovate, to 10 in. across, toothed, prickly on both sides, bright green: fr. scarlet, ⅓ in. long. Alaska to Calif.

ECHINOPS. Globe Thistle. *Compositæ.* Stout erect thistle-like per. and bien. herbs with coarse pinnatifid spinescent lvs. tomentose or white-woolly underneath: florets each with its own involucel, all aggregated into a spherical dense head that bears a small reflexed common involucre at its base; achenes hairy; pappus either an entire cup, or a dentate or fimbriate crown comprised of more or less united parts; the bracts of the involucel and the pappus afford distinguishing marks for the identification of the species, which are confused in cult. The species of Echinops are many, distributed from Portugal and Spain to India and Cent. Asia, and also in Afr.

The globe thistles are bold plants good for striking effects in the border or in colonized clumps. The prominent stiff involucel scales are metallic-blue in the cultivated kinds, giving the head a pleasing color effect; the little corollas themselves may be blue or white. The plants are of simple culture, in open places. Propagation is by seed, which gives blooming plants the following summer; but perennial kinds may be increased also by dividing the clumps and by root-cuttings. They are hardy North.

bannaticus. Per. to 3 ft. and more, the st. lightly canescent: lvs. rather thin, green above and canescent underneath, lower ones petioled and lyrate or somewhat divided into large oblong segms., the margins ciliate-spinulose, upper lvs. small and clasping: involucel bracts 18–20, glabrous; pappus scales united at base. S. E. Eu., Asia Minor.

commutatus of lists: perhaps *E. exaltatus.*

dahuricus. Per., st. hairy-pubescent at base and cobwebby above: lvs. smooth above, white-tomentose underneath, pinnatifid into either narrow-lanceolate or broad-lanceolate segms., margin with small spines: involucel bracts slender- acuminate and ciliate; pappus a fimbriate crown. Siberia, Mongolia.—Imperfectly known as a cult. plant.

exaltatus. Bien. to 3 or 4 ft., st. simple or nearly so, glandular-hairy and cobwebby: lvs. somewhat rough above, grayish-woolly underneath, unevenly pinnatifid and small-spined: head large, blue; involucel bracts long-acuminate, short-ciliate; pappus a rim or entire cup. E. Eu., probably Russia.

Gmelini: probably *E. dahuricus.*

humilis. Per., 3–4 ft., st. simple and 1-headed: lvs. villous-cobwebby above, white-tomentose underneath, lower ones short-petioled, sinuate-lyrate and obtuse, nearly spineless, st.-lvs. oblong-linear and spiny-toothed: involucel bracts long-ciliate; pappus a fimbriate crown. Siberia.

niveus of lists: probably *E. sphærocephalus.*

pumilum: listed name.

Ritro. Small G. Per., 1–2 ft., st. glandless, terete, branched above, white-tomentose: lvs. nearly glabrous or somewhat webby above, white-tomentose underneath, much pinnatisect into narrow or linear and very spiny short lobes: involucel bracts about 20, the outer ones short and broad-triangular and dentate, the others lanceolate and ciliate; pappus scales united to about the middle. Spain to Asia Minor and Siberia.—Apparently little cult. although the name is common in the lists: see *E. sphærocephalus.*

ruthenicus: confused name; probably a form of *E. Ritro* is meant.

sphærocephalus. Great G. Per. to 5 and 8 ft., branched, st. grooved, glabrous or somewhat canescent or cobwebby on branches and more or less finely glandular or viscid: lvs. green and roughish above and with scattered viscid hairs, canescent underneath, pinnatifid into triangular-oblong spinulose segms.: head large, to 2 in. across; involucel bracts about 16, somwhat viscid, ciliate-pectinate; pappus united above the middle. Cent. and S. Eu., N. Afr. to Siberia.—Common in cult. and sometimes sparingly escaped; apparently sometimes passes for *E. Ritro.*

syriacus: *E. viscosus.*

viscosus (*E. syriacus*). Per., st. tall, branched, mostly canescent and with reddish glandular hairs: lvs. greenish or canescent above and with glandular hairs, canescent underneath, lobed or pinnate into spinose lanceolate revolute segms.: head large; involucel bracts 20–22, glabrous or glandular; pappus united ⅓ or less its length. Medit. Isls. to Asia Minor.

ECHINOPSIS. Sea Urchin Cacti. *Cactaceæ.* Low condensed plants with ribs continuous or undulate, bearing the areoles which are felted or spiny: fls. from old areoles just above the clusters of spines, narrowly funnelform with long tube, mostly white, the ovary and fr. not spiny. S. American cacti, east of the Andes, perhaps 30 known species although many more names have been applied in the genus; many of the species have also been named in Cereus. See *Cacti.*

The kinds of echinopsis are often showy because of the long flowers, and although not much grown with us they are capable of making good window-garden and conservatory subjects.

Eyriesii. Simple or clustered, globular to columnar, ribs 11–18, spines 14–18, very short: fls. from side of plant toward top, white. S. Brazil to Argentina.

gemmata: *E. turbinata.*

Muelleri: garden form, probably hybrid.

multiplex. Simple or proliferous, globular to club-shaped and rounded at top, to 6 in. high, ribs 13–15, radials 5–15, centrals 2–5: fls. rose-color, 6–8 in. long, tube enlarged. S. Brazil.

oxygona. Subglobose, simple or clustered, to 10 in. diam., somewhat glaucous, ribs 14, spines about 14: fls. about midway of body, to nearly 1 ft. long, pale red inside. S. Brazil to Argentina.

Pentlandii: *Lobivia Pentlandii.*

tubiflora. Simple or clustered, nearly globose, about 5 in. diam., ribs about 12, spines awl-like and black, to ½ in. long: fls. from side, 6–8 in. long, white inside. Brazil, Argentina.

turbinata (*E. gemmata*). Simple or clustered, globose, ribs 13 or 14, spines several and about ¼ in. long: fls. near top, about 6 in. long, jasmine-fragrant, white inside. Argentina.

ECHINOSPERMUM: *Lappula.*

ECHITES. *Apocynaceæ.* Twining shrubs with opposite simple lvs., salverform clustered fls. in purple, red, yellow, white, and fr. of 2 spreading follicles, the seeds with a tuft of hairs; native in trop. Amer. and one intro. to S. Calif.

tomentosa. Savannah Flower. Very hairy: lvs. oblong, to 4 in. long, lobed at base: fls. yellow with red center, 2 in. long, in long-stalked clusters. Trinidad, N. S. Amer.

ECHIUM. Vipers-Bugloss. *Boraginaceæ.* Bien. and per., bristly, herbs, sometimes shrubs, with alternate simple lvs. and blue, purple, rose or white irregular fls. in coiled racemes that are sometimes aggregated into long showy spikes. The species are native in the Old World, but *E. vulgare* is extensively nat. in this country.

Some of the large Canarian species are much planted in California, and other kinds are grown elsewhere in warm regions and sometimes under glass; the names are yet misunderstood. All of them thrive in open sunny places. Propagated by seeds or the shrubby kinds by cuttings and layers.

Bourgæanum. Shrub to 11 ft.: lvs. linear, drooping: fls. rose, in dense pyramidal spikes. Canary Isls.

candicans. White-hairy shrub to 6 ft.: lvs. lanceolate: fls. white or blue with white lines, in dense one-sided spikelets aggregated into a long spike. Madeira, Canaries.

creticum. Ann. to 2 ft., hairy: lvs. oblong to lanceolate: fls. brick-red, the spikelets in a loose cyme. S. Eu.

fastuosum. Gray-hairy shrub to 6 ft.: lvs. lanceolate: fls. purple or dark blue with red stamens, the dense one-sided spikelets aggregated into a cylindrical spike. Eu., Canaries.

giganteum. White-hairy shrub to 10 ft.: lvs. lanceolate: fls. white, the spikelets in a dense panicle, the stamens long-exserted. Teneriffe.

plantagineum. Ann. or bien. to 3 ft., with stiff white hairs and no tomentum: lvs. oval to oblong-lanceolate, passing into broad-based bracts: fls. combined of blue and light purple, not pubescent outside but with hairs, the spikelets forming a long panicle. S. Eu.

vulgare. Blue-Weed. Bien. to 2½ ft., with stiff white hairs: lvs. oblong to linear-lanceolate: fls. blue or violet-purple, in narrow panicles, the stamens long-exserted. Eu., Asia.

Wildpretii. Bien. to 3 ft., white-hairy: lvs. linear-lanceolate, sessile: fls. rose, in large terminal cymes, the stamens long-exserted. Canary Isls.

EDDO: *Colocasia esculenta.*

EDELWEISS: *Leontopodium alpinum.*

EDGEWORTHIA. *Thymelæaceæ.* Two shrubs in Himalayas, China and Japan, somewhat like Dirca, bearing dense heads of fragrant little yellow fls. in advance of the foliage or with it: lvs. alternate and crowded at ends of branches, entire: fr. a drupe-like dry body. **E. papyrifera** (*E. chrysantha, E. Gardneri*), Paper-Bush, Mitsumata, is not hardy N. nor does it thrive in hot dry summers, but is intro. in N. Amer.: small shrub with tough branches: lvs. lance-oblong, to 5 in. long: fls. precocious, narrow-tubular, silky, to ½ in. or more long. China, Japan.—The bast is a source of soft tough paper.

EDRAIANTHUS (sometimes spelled *Hedraianthus*). *Campanulaceæ.* Per. herbs of the Medit. region, with linear lvs. and bell-shaped 5-lobed fls. in heads or rarely solitary; differs from Wahlenbergia in technical characters of fr.

caudatus: *E. tenuifolius.*

dalmaticus: *E. tenuifolius.*

Kitaibelii. To 6 in., densely tufted: fls. blue, in 3–5-fld. heads. S. E. Eu.

latifolius: listed name.

tenuifolius (*E. caudatus. E. dalmaticus*). To 6 in., tufted, pubescent: fls. blue, in dense 3–8-fld. bracted heads. S. E. Eu.

EDWINIA: *Jamesia.*

EEL-GRASS: *Vallisneria.*

EGG-FRUIT: *Lucuma nervosa.*

EGGPLANT (*Solanum Melongena* var. *esculentum*). Tender branching large-leaved herb, grown in the vegetable-garden for the edible fruits; sometimes known also as Guinea squash. The large fruits, in purple, white, and stripes, are cooked in various ways.

The eggplant is well at home in the southern states, the long season suiting it. Seeds may be sown in a plant-bed, and the young plants moved directly to the field. In the North, unless one has a greenhouse or warm hotbed, the growing of eggplants should be left to the professional gardener, as the young plants are very tender and should be grown without a check. The seed may be sown in the hotbed or greenhouse a month or more before warm weather, keeping a temperature of 65° to 70°. When the seedlings have made three rough leaves, they may be pricked out into shallow boxes, or, still better, into 3-inch pots. The pots or boxes should be plunged to the rim in soil in a hotbed or coldframe so situated that protection may be given on chilly nights. Do not set in the field until the season is permanently settled. The soil should be "quick" but not of such nature as to keep the plants growing too large or too late. Watch for the potato-beetle. The plants are usually set 2–3 feet apart each way. A dozen plants are sufficient for the needs of a family, as each plant should yield two to six large fruits. The fruits are fit to eat at most stages of growth, from those the size of a large egg to their largest development. One ounce of seed will furnish 1,000–2,000 plants.

New York Improved Purple is a standard variety of eggplant. Black Pekin, Long Purple and Black Beauty are popular. For early, or for a short-season climate, the Early Dwarf Purple is desirable.

EHRETIA. *Boraginaceæ.* Trop. or semi-trop. shrubs or trees with alternate dentate or entire simple lvs. and short rough hairs, small white fls. in terminal corymbs or panicles or perhaps solitary, and fr. a small drupe; sometimes planted for ornament and interest in the extreme S. U. S. Propagated by seeds and cuttings.

acuminata: see *E. thyrsiflora.*

buxifolia: *E. microphylla.*

elliptica. Tree to 50 ft.: lvs. oval or oblong, to 2 in. long, undulate or serrate: fls. in corymbs to 2½ in. across. Tex. to Mex.

lævis. Variable shrub, or tree to 40 ft.: lvs. ovate, short-acuminate, to 5 in. long, serrate: fls. in corymbs 3 in. across. India.

macrophylla. Tree, with elliptic or rhomboid pubescent or hairy lvs. to 8 in. long, serrate: fls. small, in compound panicles: fr. a berry ½ in. or more diam. India; planted in S. Calif.

microphylla (*E. buxifolia*). Philippine-Tea. Shrub to 12 ft.: lvs. in clusters, obovate, to 2½ in. long, serrate: fls. solitary or 2–4 together. India to Malaya and Philippines.

thyrsiflora (*Cordia thyrsiflora. E. acuminata* of some.) Tree to 50 ft.: lvs. obovate, to 7 in. long: fls. in panicles to 8 in. long. Formosa: fairly hardy N.

EICHHORNIA (*Piaropus*). *Pontederiaceæ.* Trop. American aquatic herbs with floating or submerged lvs. and showy fls. mostly borne in terminal spikes; grown in ponds and tanks. The water should not be more than about 1 ft. deep and good soil provided. Propagated by division.

azurea. Lvs. broadly ovate to orbicular, the petioles not inflated: fls. lavender-blue with purple center. Brazil.

crassipes. Water-Hyacinth. Floating extensively, with feathery roots: lvs. ovate to orbicular, the petioles much inflated at base: fls. large and showy, violet with blue patch on upper lobe having a yellow spot. Trop. Amer. and nat. in Fla. where it chokes the ponds and streams. Var. **major** has rosy-lilac fls.

EINKORN: *Triticum æstivum* var. *monococcum*.

ELÆAGNACEÆ. Oleaster Family. Trees or shrubs of Eu., Asia, N. Amer. covered with silvery or golden scales, having simple and entire lvs., bisexual, polygamous or diœcious polypetalous fls. with 2–4-lobed calyx, no petals, 4 or 8 stamens, 1-celled ovary, and fr. inclosed by the fleshy calyx, forming a berry-like or drupe-like body. There are only three genera, Elæagnus, Hippophaë and Shepherdia, and they are grown for ornament and somewhat for edible fr.

ELÆAGNUS. *Elæagnaceæ.* Ornamental shrubs or small trees in many species, sometimes evergreen, with alternate lvs. covered with scales, inconspicuous fls., and attractive drupe-like frs.; native in N. Amer., S. Eu., Asia.

The species grow in any well-drained soil and sunny location. Propagated by seeds, preferably stratified and sown the second spring, hardwood- and root-cuttings, layers, and grafting.

angustifolia (*E. hortensis*). Oleaster. Russian Olive. Very hardy, to 20 ft., deciduous, sometimes spiny: branchlets and under sides of lvs. silvery: fls. fragrant, 1–3 in axils of lvs., in June: fr. yellow and silvery, on very short stalks. Eu., W. Asia. Var. **orientalis** has broader lvs. and larger fr. and var. **spinosa** is more spiny.

argentea. Silverberry. to 12 ft., deciduous: lvs. silvery on both sides: fls. fragrant, 1–3 in axils, May–June: fr. silvery, on very short stalks. E. Canada, to Minn. and Utah.

Fruitlandi: a form of *E. pungens*.

glabra. To 20 ft., evergreen, climbing or sarmentose: under sides of lvs. with brown scales: fls. fragrant, in autumn: fr. gray or rusty. Japan, China.

hortensis: *E. angustifolia.*

latifolia. Variable, either erect or climbing, sometimes tree-like: lvs. ovate to elliptic or broader, obtuse or acute, to 5 in. long, silvery or rusty underneath: fls. many, clustered: fr. to 1½ in. long, red. India.

longipes: *E. multiflora.*

macrophylla. To 12 ft., evergreen: lvs. silvery beneath, becoming dark shining green above: fls. fragrant, 4–6 in axils, in autumn: fr. red. Japan; to be grown far S.

multiflora (*E. longipes*). Gumi. To 6 ft., deciduous: lvs. silvery beneath, also with brown scales: fls. fragrant, 1–2 in axils, Apr.–May: fr. scarlet, on slender stalks to 1 in. long, edible. Japan, China; hardy in the N. Leaf forms are known under the varietal names **crispa, ovata** and **rotundifolia.**

parvifolia: *E. umbellata* var.

philippensis. To 9 ft., with drooping branches: lvs. silvery beneath, slightly toothed: fls. axillary, often solitary: fr. red. Philippines.

pungens. To 15 ft., evergreen, usually spiny: lvs. silvery beneath dotted with brown scales, wavy-margined: fls. fragrant, in axillary clusters in autumn: fr. red, silvery and brown when young, short-stalked. Japan, China. Variegated forms are **aurea,** lvs. margined yellow; **Frederici** (var. *Frederici variegata*), lvs. with yellow center; **maculata** (*aureo-maculata*), lvs. with large yellow blotch in middle; **variegata,** lvs. margined with yellowish-white. In var. **reflexa** the lvs. are very brown-scaly beneath and the margins not wavy; var. **Simonii** (*E. Simonii*), lvs. silvery beneath, sometimes variegated yellow and pinkish-white. The various leaf forms are often grown under glass; in the open hardy only far S.

reflexa: *E. pungens* var.

Simonii: *E. pungens* var.

umbellata. To 18 ft., deciduous, branchlets covered with brown scales: lvs. silvery beneath: fls. fragrant, 1–3 in axils, May–June: fr. scarlet, silvery when young, short-stalked. Himalayas, China, Japan. Var. **parvifolia** (*E. parvifolia*). Branchlets silvery: fr. silvery becoming pink. Himalayas.

ELÆIS. *Palmaceæ.* Monœcious tall feather-palms of trop. Afr. and Amer., perhaps of 4 or 5 species, unarmed except perhaps on the petiole and bracts and tips of spadices: spadices among the lvs., branched but short, dense and head-like in the center of the crown, some of them staminate and others pistillate; stamens 6: fr. a 1–3-seeded ovoid or obovoid drupe surrounded by spine-like bracts in a heavy compact head or cluster. See *Palm.*

guineensis. African Oil Palm. Trunk to 60 and more ft., much scarred: lvs. 10–15 ft. long, the lower ones drooping and some of the dead ones hanging, with very many ridged narrow pinnæ, green both sides: staminate head composed of many finger-like appressed spine-tipped branches 4–6 in. long; fruiting head 1 ft. long more or less: fr. ovoid or ovoid-conic, about 1 in. long, red, orange or yellowish. W. and Cent. Afr.—Prized for the oil-bearing frs. and planted for ornament and interest in the western hemisphere; stands in S. Fla.

ELÆOCARPACEÆ. Elæocarpus Family. About 8 genera of trees and shrubs, allied to Tiliaceæ, native in tropics and semi-tropics of both hemispheres: lvs. alternate or opposite, simple: fls. unisexual or bisexual, polypetalous, often showy, in racemes or panicles, having 4–5 sepals and petals, or sometimes petals absent, numerous stamens, superior ovary: fr. a caps. or drupe. Aristotelia, Crinodendron and Elæocarpus are known to hort. in the U. S., all grown in the warmer parts of the country.

ELÆOCARPUS. *Elæocarpaceæ.* Trees native in the tropics and warm parts of the Old World, with alternate simple lvs., mostly bisexual fls. in axillary racemes, and small drupaceous frs.; sometimes grown for ornament in S. U. S., and in Calif. Propagated by cuttings, and by seeds when obtainable.

cyaneus. Small mostly glabrous tree: lvs. oblong or elliptic to nearly lanceolate, acuminate, to 4 in. or more, serrate: fls. in loose racemes: fr. with 1 seed to ½ in. long. Queensland.

dentatus. To 60 ft., foliage mostly at ends of branchlets which are silky: lvs. leathery, linear-oblong to narrowly obovate, to 4 in. long, finely wavy-toothed, the margins recurved: fls. white, ½ in. across, drooping: fr. purplish-gray, ½ in. long. New Zeal.

Hookerianus. Tree to 40 ft. with glabrous branchlets: lvs. narrowly linear to nearly orbicular and even pinnate-toothed on young parts, narrow-oblong or lanceolate and serrate or crenate on old plants: fls. greenish-white and drooping: fr. ⅛ in. long. New Zeal.

ELÆODENDRON. *Celastraceæ.* Trop. or semi-trop. trees and shrubs with simple leathery lvs., small greenish or white fls. in axillary clusters, and drupaceous fr.; grown in trop. or warm regions or under glass in the juvenile state. Propagated by cuttings.

capense. Evergreen shrub: lvs. elliptic-ovate, margins revolute and slightly toothed: frs. red, to 1 in. long. S. Afr.

Laneanum. BERMUDA OLIVE-WOOD BARK. Evergreen tree to 45 ft.: lvs. oblanceolate, shallowly toothed: fls. diœcious: frs. yellowish-white, to 1 in. long. Bermuda.

orientale (*Aralia Chabrieri* of gardens). FALSE OLIVE. Lvs. obovate, wavy-margined, in the juvenile state long and narrow with a dark red midrib: frs. about size of olive. Madagascar, Mauritius.

ELAPHOGLOSSUM. *Polypodiaceæ.* Trop. ferns with creeping rhizomes and simple rather thick more or less tongue-like lvs.; sori covering under surface of lvs. They are treated as warmhouse plants, requiring abundant moisture if drainage is good. See *Ferns.*

crinitum (*Acrostichum* and *Hymenodium crinitum*). ELEPHANT-EAR-FERN. Lvs. to 2 ft. long and 10 in. wide, on shaggy-hairy stalks 1 ft. long. W. Indies, Mex., Cent. Amer.—A striking plant.

ELATINOIDES: *Kickxia.*

ELDER: *Sambucus.* **Box-:** *Acer Negundo.* **Yellow-:** *Stenolobium stans.*

ELECAMPANE: *Inula Helenium.*

ELEPHANTS-EAR: *Colocasia, Enterolobium cyclocarpum.*

ELEPHANTS-FOOT: *Testudinaria elephantipes.*

ELETTARIA. CARDAMON. *Zingiberaceæ.* Per. herbs of 1 or more species native in India, the seeds of which are used medicinally and as spices. **E. Cardamomun.** To 10 ft., with creeping rootstocks: lvs. to 2½ ft. long and 3½ in. wide: fls. white, the lip or staminodium margined with yellow and striped with blue, borne in bracts on panicles to 2 ft. long: caps. to ¾ in. long, containing aromatic seeds.—The plants succeed in moist shady places in warm climates. Propagated by division of roots and by seeds. See *Zingiberaceæ.*

ELEUSINE. *Gramineæ.* Tufted annuals with flat lvs. and spikelets in dense spikes borne in digitate terminal umbels or toward top of sts.; native in the Old World and grown for ornament and in some countries for grain. See *Grasses.*

barcinonensis: *E. tristachya.*

coracana. AFRICAN MILLET. To 4 ft.: lvs. to 1 ft. long and ¼ in. wide: spikes to 1½ in. long and ¼ in. broad, erect. Probably Asia and Afr.

indica WIRE-GRASS. To 2 ft.: lvs. to 1 ft. long and ¼ in. wide: spikes to 4 in. long, spreading. Old World, but nat. in N. and trop. Amer.

oligostachya: the plant grown under this name is *E. indica.*

tristachya (*E. barcinonensis*). To 1 ft.: lvs. short, 1/16 in. wide: spikes to 1½ in. long and ⅓ in. broad. India.

ELLIOTTIA. *Ericaceæ.* One deciduous shrub, **E. racemosa,** inhabiting sandy lands and pine woods in E. Ga. and S. C.: to 10 or 20 ft., sometimes tree-like: lvs. alternate, oblong to oblong-lanceolate, to 5 in. long, pointed, entire, glabrous above: fls. small, white, in slender terminal racemes. To be expected in grounds.

ELLIPTIC: a flat part or body that is oval and narrowed to rounded ends.

ELM: *Ulmus.* **Water-:** *Planera aquatica.*

ELODEA. *Hydrocharitaceæ.* Aquatic submerged perennials with soft leafy sts. and inconspicuous unisexual or bisexual fls.; grown in aquaria and ponds and spreads rapidly. Propagated by cuttings and winter-buds.

canadensis (*Anacharis canadensis. Philotria canadensis*). WATER-WEED. DITCH-MOSS. Lvs. about ¼ in. long and 1/12–1/6 in. wide, more or less obtuse, at the top of the st. strongly imbricated: fls. whitish, the pistillate with tube elongated, allowing fls. to float on surface; staminate fls. not known. Que. south and west; nat. in Eu.—Material in aquaria may also represent *E. occidentalis,* a plant with narrower more pointed not imbricate lvs., and distinct staminate fls.; native but not extending as far north.

densa (*Anacharis canadensis* var. *gigantea*). Lvs. densely crowded, to 1 in. long and much broader than in *E. canadensis.* La Plata River.

ELONGATE: lengthened; stretched out.

ELSHOLTZIA. *Labiatæ.* Herbs or undershrubs grown for their dense spikes of small 2-lipped blue or lilac fls., usually aromatic; stamens 4, exserted: lvs. opposite, toothed.

Elsholtzias require a sunny position for the most success in blooming. Propagated by seeds sown in the spring, the shrubby types also by greenwood cuttings in summer. The species below are hardy North.

cristata. Ann. to 1½ ft.: lvs. ovate to oblong, to 2 in. long: fls. light blue, in spikes to 3 in. long in terminal panicles. Asia.

Stauntoni. Shrub to 5 ft.: lvs. ovate-oblong to oblong-lanceolate, to 5 in. long: fls. lilac-purple, in dense one-sided spikes to 8 in. long terminating the branches, Sept.–Oct. N. China.

ELSOTA: *Securidaca diversifolia.*

ELYMUS. WILD RYE. LYME-GRASS. *Gramineæ.* Tall per. grasses of temp. regions around the world, the spikelets borne in dense terminal spikes; a few may be planted for ornament on banks and rear borders. See *Grasses.*

arenarius. SEA LYME-GRASS. DUNE-GRASS. To 8 ft.: lvs. 1 ft. or more long and ⅓ in. wide, becoming involute, rough above: spikes to 10 in. long, awnless. Asia, Eu.—Used as a sand binder.

canadensis. To 5 ft.: lvs. 1 ft. or more long and ¾ in. wide, rough: spikes to 1 ft. long, often nodding, awns to 2 in. long. N. Amer.

condensatus. To 10 ft.: lvs. 1 ft. or more long and 1 in. wide, rough: spikes stout, to 15 in. long, awnless. W. N. Amer.

giganteus. Erect to about 3 ft., with creeping rhizomes: lvs. rather stiff, to ½ in. broad: spikes to 15 in. long, with awn points. Russia, Siberia.

glaucus. To 5 ft.: lvs. to 1 ft. long and ½ in. wide, nearly smooth: spikes to 8 in. long, awns to ¾ in. long. Ont. to B. C. and Calif.

mollis. Differs from *E. arenarius* (of which it is often considered a var.) in the pubescent spikelets.

virginicus. To 3 ft.: lvs. to 14 in. long and ½ in. wide, rough: spikes to 7 in. long, awns to ½ in. long. N. S. to Fla. and Tex.

EMARGINATE: with a shallow notch at the apex.

EMBLIC: *Phyllanthus Emblica.*

EMBOTHRIUM. *Proteaceæ.* A few shrubs and small trees of the southern hemisphere, one of which is intro. in Calif.: lvs. coriaceous, entire: fls. bisexual, showy, in dense racemes: fr. 1-celled many-seeded follicle. **E. coccineum,** of Chile, is a shrub with oblong to elliptic alternate lvs.: fls. scarlet, about 2 in. long, with exserted red style.

EMILIA. *Compositæ.* Slender herbaceous annuals and perennials with alternate and basal lvs. and solitary or clustered rather small rayless heads in many colors; pappus of white soft bristles; mostly native in tropics of Old World. Two species, commonly confused, are grown as flower-garden annuals; of simple cult. in a sunny place.

coccinea: *E. sagittata.*

flammea: *E. sagittata.*

sagittata (*E. flammea. E.* and *Cacalia coccinea*). TASSEL-FLOWER. FLORAS-PAINTBRUSH. Ann. to 2 ft.: lower lvs. ovate, toothed, narrowly wing-petioled: heads red or scarlet, ½ in. across, in loose corymbs. Tropics. Var. lutea has golden-yellow fls.—This is the usual species in gardens.

sonchifolia (*Cacalia sonchifolia*). Ann. to 2 ft.: lower lvs. obovate, toothed or lyrate-pinnatifid: heads rose or purple, rarely white, ½ in. across, in loose corymbs. Tropics.

EMMENANTHE. *Hydrophyllaceæ.* Ann. herbs native in W. N. Amer., with alternate lvs., yellow fls. in terminal racemes and bell-shaped persistent corolla.

Seeds may be sown where the plants are to grow, or indoors if early bloom is desired, in open sunny exposure.

penduliflora. YELLOW- or GOLDEN-BELLS. WHISPERING BELLS. To 1½ ft., but often only a few inches: lvs. pinnatifid into ovate segms.: fls. drooping, about ½ in. long, in summer. Calif., on slopes and deserts.

EMMENOPTERYS. *Rubiaceæ.* One deciduous tree to 40 ft., adaptable to mild climates. Propagated by seeds and cuttings of soft wood under glass. **E. Henryi** has lvs. opposite, oval, to 6 in. long, entire: fls. yellow, funnelform, 1 in. long, in many-fld. terminal panicles: fr. a caps. to 1¾ in. long, often with 1 wing-like calyx-lobe persistent. Cent. China.

EMMER: *Triticum æstivum* var. *dicoccum.*

EMPETRACEÆ. CROWBERRY FAMILY. Three genera of heath-like evergreen small shrubs in the northern hemisphere: lvs. alternate and crowded, linear: fls. bisexual or unisexual, regular, with 2–3 sepals or none, no petals, 2–3 stamens, superior ovary: fr. a drupe. In the sequence of orders this family stands near Euphorbiaceæ. Corema and Empetrum are sometimes grown for ornament.

EMPETRUM. *Empetraceæ.* A few shrublets, more or less procumbent or depressed, of the western hemisphere and N. Eurasia, sometimes transferred to grounds: fls. very small, solitary in the axils: fr. a little drupe. **E. nigrum.** CROWBERRY. Spreading heath-like evergreen to 10 in. high: lvs. linear or nearly so, about ¼ in. long, margins revolute: drupe berry-like, black. Var. **purpureum** has red or purple fr. Rocky places N. Y. to N. Calif. and northward, and in N. Eu. and Asia and mts. southward; adapted to rock-gardens.

ENCELIA. *Compositæ.* Herbs or subshrubs with alternate or opposite entire or toothed lvs. and rather showy heads of yellow ray-fls. and yellow or purple disk-fls.; pappus none or of awns; native from W. N. Amer. to Chile. Sometimes planted for ornament.

californica. Per., woody at base, to 4 ft., strong-scented: lvs. ovate to broad-lanceolate, to 2½ in. long: heads solitary, long-stalked, 2½ in. across, golden-yellow, disk purple; involucre white-hairy. Calif.

farinosa. Shrubby, to 5 ft.: lvs. ovate, to 2½ in. long, often silvery-tomentose: heads in cymes, about 1 in. across, with yellow disk and rays; involucre slightly pubescent. Calif., Ariz., Mex.—The clumps are very showy early in season on deserts.

ENCEPHALARTOS. *Cycadaceæ.* African plants with stout trunks terminated by a cluster of stiff pinnate lvs.; about 20 species of which a few are grown for the ornamental foliage. For cult. see *Cycas*, from which the genus is separated by technical characters of fls. and frs., and pinnæ without midrib.

Altensteinii (*Zamia Altensteinii*). Trunk to 6 ft. high and 1 ft. diam.: lvs. to 6 ft. long; lfts. thick, very spiny when young but on older plants often spineless, about 1 in. broad. S. Afr.

Hildebrandtii. Trunk to 20 ft. high and 1 ft. diam.: lfts. leathery, margins with 1–4 teeth on either side, tip spiny. Trop. Afr.

Laurentianus. Trunk to 30 ft. high and 2½ ft. diam.: lvs. to more than 20 ft. long; lfts. leathery, margins with 6–10 teeth on either side, spiny-tipped, some of them to 16 in. long and 2 in. broad. Trop. Afr.

Lehmanni. Trunk very large: lfts. pale green, to 7 in. long, entire or occasionally with 1 or 2 spines, tip spiny, petiole and rachis somewhat 4-angled. S. Afr.—The plants advertised as *Zamia Lehmanni glauca* and *Skinneri* probably belong here.

villosus (*Zamia villosa*). Trunk entirely underground, woolly: lvs. to 6 ft. long; lfts. bright green, with spiny teeth and tips. S. Afr.

ENCHOLIRION: *Vriesia Saundersi.*

ENCHYLÆNA. *Chenopodiaceæ.* Little shrub allied to Kochia, native in Australia, **E. tomentosa,** adapted to planting in dry climates for its dense spreading habit and gray or silvery color: procumbent or horizontally much branched, to 3 ft. or more and making a broad mass: lvs. terete, ½ in. or less long: fls. small, solitary in axils, followed by fleshy red or yellow berry-like bodies.

ENCYCLIA. *Orchidaceæ.* Trop. American epiphytes with short pseudobulbs bearing 1–3 leathery lvs. and fls. in terminal racemes or panicles, the sepals and petals similar, lip 3-lobed; by some considered a section of Epidendrum. For cult. see *Orchids.*

aromatica (*Epidendrum aromaticum*). Lvs. to 1 ft. long: fls. primrose-yellow, fragrant, in many-fld. pendulous panicles to 3 ft. long, July–Sept. Mex., Guatemala.

atropurpurea (*Epidendrum atropurpureum* and *macrochilum*). Lvs. to 1 ft. long: fls. about 3 in. across, in 4–10-fld. racemes to 1½ ft. high; sepals and petals green, brown inside; lip white marked with red, Apr.–June. Cent. Amer., W. Indies.

nemoralis (*Epidendrum nemorale*). Lvs. to 1 ft. long: fls. rose, the lip marked with purple, to 4 in. across, in 8–15-fld. racemes to 16 in. long, July. Mex.

odoratissima (*Epidendrum odoratissinum*). Lvs. less than 1 ft. long: fls. greenish with yellowish lip marked with red, 1 in. across, in 5–15-fld. racemes to 10 in. long, June–July. Brazil.

osmantha (*Epidendrum osmanthum* and *Godseffianum*). Lvs. to 16 in. long: fls. about 2 in. across, in many-fld. racemes; sepals and petals yellow-green veined with red; lip white marked with red, Oct. Brazil.

virens (*Epidendrum virens*). Lvs. to 1½ ft. long: fls. about 2 in. across, in many-fld. panicles to 3 ft. high; sepals and petals yellow-green marked with brown; lip white lined with rose, May–June. Cuba, Guatemala, Venezuela.

virgata (*Epidendrum virgatum*). Lvs. to 10 in. long: fls. 1 in. across, in panicles to 6 ft. high; sepals and petals green tinged with brown; lip yellowish-white, July–Aug. Mex., Guatemala.

ENDIVE (*Cichorium Endivia*). Hardy annual or biennial, grown for its rosette of leaves which are used as salad and for greens. It is grown mostly as a late summer, autumn and early winter product, more or less extending the season of lettuce.

For summer harvest, seeds may be sown in April or early May, in drills in the garden. For autumn use, sowings may be June to August, and as the plants become fit to eat about the same time from sowing as does lettuce, a succession may be had until cold weather. The plants need protection from severe frosts by carefully lifting the plants and removing to a frame, where sash or cloth may cover them in freezing weather. The leaves, which constitute practically the whole plant, are blanched before being used, either by tying together or by standing boards on each side of the row, allowing the top of the boards to meet over the center of the row; in two to four weeks the interior leaves will be sufficiently blanched. If the foliage keeps wet inside, it is likely to decay; the leaves should be tied together only when dry, and it may be necessary to untie and open them after a rain, and a similar precaution is necessary in other methods of blanching. The rows should be 1½ or 2 feet apart, the plants 1 foot apart in the rows. One ounce of seed will sow 150 feet of drill more or less, before thinning or transplanting.

ENKIANTHUS. *Ericaceæ.* Mostly deciduous shrubs with alternate or crowded finely toothed lvs. turning bright colors in autumn, fls. in drooping umbels or racemes in spring, and capsular frs.; native in Asia and fairly hardy in the N. They thrive in well-drained peaty soil, like many other plants of the Heath family. Propagated by seeds, cuttings or layers.

campanulatus. To 30 ft.: fls. yellow or pale orange veined with red, bell-shaped, to ½ in. long. Japan.

cernuus. To 15 ft.: fls. white, bell-shaped with irregularly cut limb, ⅓ in. long. Japan. Var. **rubens** has deep red fls.

coloratus: listed name.

japonicus: *E. perulatus.*

perulatus (*E. japonicus*). To 6 ft.: fls. before the lvs., white, urn-shaped, ⅓ in. long, the corolla gibbous at base. Japan.

subsessilis. To 10 ft.: fls. white, urn-shaped, ⅙ in. long, gibbous at base. Japan.

ENTELEA. *Tiliaceæ.* One large-lvd. shrub or small tree to 20 ft., native in New Zeal. and planted in S. Calif. **E. arborescens.** Lvs. alternate, cordate-ovate, to 9 in. or more long, toothed and often slightly 3-lobed: fls. white, 1 in. across, in cymes: fr. a bristly caps. 1 in. across. For *E. palmata* see *Sparmannia palmata.*

ENTEROLOBIUM. *Leguminosæ.* Trop. American trees with 2-pinnate lvs., fls. in heads or clusters with prominent whitish, greenish or purplish stamens, and broad leathery pods which are usually bent or coiled inward; planted in the tropics as windbreaks or for ornament.

cyclocarpum. ELEPHANTS-EAR. CARO. Large broad-headed tree to 50 ft. or more: lfts. 20–30 pairs: stamens white: pods bent so as to form a complete circle, used as cattle feed in tropics. Jamaica, Venezuela.

Timbouva. Differs in its fewer lfts., 10–20 pairs, and the pods bent to form one-half or two-thirds of a circle. Brazil.

ENTIRE: margin continuous, not in any way indented; whole.

EOMECON. *Papaveraceæ.* The only species, **E. chionantha,** from China, is a rhizomatous herbaceous per. with white poppy-like racemose fls. 2 in. across on a slender branching scape 1 ft. or more tall: lvs. radical and long-stalked, cordate, to 6 in. long, sinuate: petals 4: spring-blooming and hardy at N. Y. City. Known as Snow-Poppy.

EORA: *Rhopalostylis.*

EPACRIDACEÆ. EPACRIS FAMILY. Shrubs and small trees of the southern hemisphere related to Ericaceæ and differing in technical characters. The family comprises about two dozen genera of which only Cyathodes and Epacris are much known in cult.

EPACRIS. *Epacridaceæ.* Heath-like evergreen shrubs, seen now and then under glass and adapted to warm climates; native in Australia and New Zeal.: lvs. small and entire, scattered: fls. solitary in axils of lvs. or bracts, the short peduncle covered with imbricating bracts; corolla tubular, white, red, purple, mostly small but often showy. Treatment as for ericas.

impressa. To 3 ft., with many ascending pubescent branches: lvs. narrow-lanceolate and sharp-pointed, mostly under ½ in. long: fls. white or red; corolla-tube ½ in. or less long, differing in the several forms. Australia.

EPAULETTE-TREE: *Pterostyrax.*

EPHEDRA. MEXICAN-TEA. JOINT-FIR. *Gnetaceæ.* Shrubs growing mostly in dry or desert regions around the world, with jointed green branches resembling the horsetail, scale-like or sheath-like lvs., unisexual fls. and red berry-like frs.

Occasionally planted in this country in dry locations as ground-cover or for the green stemmy clumps, as in regions where the native kinds grow. Mexicans and Indians make a medicinal tea from the branches. Propagated by division of clumps and by seeds, suckers and layers.

altissima. Climbing to 25 ft.: lvs to 1 in long. N. Afr.

distachya. Low or procumbent shrub to 2 ft.: lvs. scale-like, opposite. S. Eu., N. Asia.

fragilis. Erect or climbing shrub, or sometimes prostrate: lvs. minute, opposite. Medit. region.

trifurca. Erect, to 4 ft., pale green: scale-like lvs., mostly in 3's. Utah to Mex.

viridis. Erect, to 4 ft., bright green: awl-like lvs. opposite. Colo. to Calif. and Ariz.

EPHEMERAL: persisting for one day only, as flowers of spiderwort.

EPIBATERIUM: *Cocculus.*

EPIDENDRUM. *Orchidaceæ.* Epiphytic orchids native in trop. Amer., with leafy sts. or 1-lvd. pseudobulbs and fls. mostly in terminal racemes, the sepals and petals similar, the lip usually deeply 3-lobed and with a distinct claw partly united with column; see *Orchids* for cult. They are plants of various habit, and require mostly intermediate temperature as for cattleyas.

aromaticum: *Encyclia aromatica.*

atropurpureum: *Encyclia atropurpurea.*

aurantiacum: *Cattleya aurantiaca.*

bicornutum: *Diacrium bicornutum.*

Boothianum (*E. erythronioides*). To 8 in. high: lvs. to 5 in. long: fls. with brown-spotted sepals and petals and yellow lip. W. Indies, S. Fla.

Boundi. Hybrid between *E. Burtoni* and *E. radicans.*

Brassavolæ. Pseudobulbs to 6 in. high, with 2 leathery lvs. to 1 ft. long and 1 in. wide: fls. to 4 in. across, in 6–12-fld. racemes; sepals and petals brownish-yellow; lip white tipped with violet-red, July–Sept. Costa Rica.

Burtoni. Hybrid between *E. O'Brienianum* and *E. ybaguense.*

ciliare (*Auliza ciliaris*). Pseudobulbs to 6 in. high, with 1–2 leathery lvs. to 6 in. long: fls. in 4–8-fld. racemes; sepals and petals yellow; lip white with 2 yellow spots, fringed, Dec.–Jan. Trop. Amer.

cochleatum. Pseudobulbs to 5 in. long, with 2 lvs. to 8 in. long: fls. in 5–8-fld. racemes to 10 in. long; sepals and petals whitish-green; lip dark purple with yellow markings, Nov.–Feb. Trop. Amer.

conspicuum (*E. roseum*). Pseudobulbs to 5 in. high, with 2 lvs. to 8 in. long: fls. pale rose, 2 in. across, in 6–12-fld. racemes to 20 in. long. Brazil.

Cooperianum. Fls. 2 in. across, in 10–25-fld. drooping racemes; sepals and petals yellowish-green; lip bright rose, Apr.–May. Brazil.

dellense. Hybrid between *E. radicans* and *E. xanthinum.*

erythronioides: *E. Boothianum.*

evectum. St. to 3 ft., without pseudobulb: fls. rich purple, with fringed lip, on long nodding peduncles. Colombia.

fragrans. Pseudobulbs to 2 in. high, with 1 lf. to 4 in. long: fls. fragrant, in 2–5-fld. racemes to 5 in. long; sepals and petals yellowish-white; lip white lined with violet, Feb.–May. Brazil, W. Indies.

galtonense. Hybrid between *E. Boundi* and *E. xanthinum.*

Godseffianum: *Encyclia osmantha.*

inversum. Pseudobulbs to 4 in. long, with 2 leathery lvs. to 6 in. long: fls. pale straw-color or white with purple spot on lip, in 7–12-fld. racemes. Brazil.

kewense. Hybrid between *E. evectum* and *E. xanthinum.*

lanipes. Fls. yellow with filiform petals, in panicles to 9 in. long. Peru.

latilabrum. Lvs. ovate: fls. 2 in. across, green, with lip about four times broader than long, in 3–4-fld. umbel-like racemes. Brazil.

macrochilum: *Encyclia atropurpurea.*

nemorale: *Encyclia nemoralis.*

O'Brienianum. Hybrid between *E. evectum* and *E. radicans.*

odoratissimum: *Encyclia odoratissima.*

osmanthum: *Encyclia osmantha.*

polybulbon: *Dinema polybulbon.*

porphyreum. Lvs. oblong: fls. purple, with linear petals and middle lobe of lip toothed. Colombia.

prismatocarpum. Psudobulbs to 5 in. long: lvs. to 15 in. long: fls. in racemes to 14 in. long; sepals and petals yellow spotted with brown; lip rose, July–Aug. Costa Rica.

radicans (*E. rhizophorum*). Sts. to 5 ft. long, with long white roots: lvs. to 2 in. long: fls. to 2 in. across, in many-fld. racemes; sepals and petals cinnabar-red; lip orange-yellow, Oct.–Jan. Guatemala.

rhizophorum: *E. radicans.*

rigidum. To 10 in., without pseudobulbs: lvs. leathery, to 2½ in. long and ¾ in. wide: fls. green, in racemes to 4 in. long. Trop. Amer.

roseum: *E. conspicuum.*

Skinneri (*Barkeria Skinneri*). Fls. dark rose, the lip with yellow ridges, 1½ in. across, in few- or many-fld. racemes, Sept.–Jan. Guatemala.

spectabile (*Barkeria spectabilis*). Fls. rose spotted with darker color, to 3 in. across, July–Sept. Guatemala.

Stamfordianum. Pseudobulbs to 6 in. high, with 3–4 lvs. to 6 in. long: fls. in leafless panicles to 16 in. long; sepals and petals yellow spotted with purple; lip white with yellow toothed midlobe, Feb.–May. Guatemala.

venosum. BUTTERFLY ORCHID. Fls. in 5–7-fld. racemes, pink, brown and green. Mex.

virens: *Encyclia virens.*

virgatum: *Encyclia virgata.*

vitellinum. Pseudobulbs to 3 in. high, with 2 lvs. to 8 in. long: fls. cinnabar-red, 1½ in. across, in 10–20-fld. racemes to 1 ft. long, Oct.–Dec. Mex. Var. **majus** has larger brighter colored fls.

xanthinum. St. leafy, to 1½ ft. or more, size of quill: fls. yellow and sometimes tinted orange, in a dense head; lip 3-lobed and fringed. Brazil.

ybaguense. St. slender and tall, leafless at top: lvs. very fleshy: fls. orange and yellow, in dense nearly globose head; lip lobed, fringed. Colombia, Peru.

EPIGÆA. *Ericaceæ.* Evergreen perennials with woody creeping sts., clusters of delightfully fragrant flesh-colored fls. in very early spring; 2 species, N. E. Amer. and Japan.

The plants can be grown in the garden if given acid soil and shade, and their natural conditions imitated. Propagation by seed is much more satisfactory than by division; sow as soon as seed is ripe.

repens. TRAILING ARBUTUS. MAYFLOWER. Sts. hairy: lvs. ovate, to 3 in. long, bright green: fls. white or pink, salverform, about ½ in. long. Newf. to Fla. and Ky.

EPILOBIUM. WILLOW-HERB. *Onagraceæ.* Herbs or sometimes subshrubs with linear to willow-like to oblong lvs., mostly more or less weedy, rose-purple, white or rarely yellow small fls., and long narrow capsular frs.

Suitable for planting in damp places and wild-gardens. Propagated by seeds or division; some of them produce runners and rosettes. They are plants of minor horticultural importance.

adnatum. Large, branched, erect, appressed-pubescent above: lvs. oblong, acute, serrulate, but some of them sessile and decurrent: fls. rose. Eu.

angustifolium (*Chamænerion angustifolium*). FIREWEED. GIANT W. Per. to 8 ft.: lvs. alternate, lanceolate, to 6 in. long: fls. purple, 1¼ in. across, in long terminal racemes. Eu., Asia, N. Amer. Var. **album** has pure white fls.

boreale. Branched per., becoming large, pubescent above: lvs. ovate to lanceolate, denticulate, to 3 in. long: fls. rosy, less than ¼ in. long, becoming abundant. Alaska.

coloratum. Per., slender, much branching, 1–3 ft.: lvs. narrow-lanceolate, serrulate, 2–6 in. long: fls. very small but numerous, axillary, pink or white. Weedy plant in low ground and dry ditches, Me. to Kans. and S. C.

Dodonæi (*E. rosmarinifolium*). Per. to 3 ft.: lvs. scattered, linear, to 2½ in. long: fls. rose-purple, rarely white, crowded near ends of branches. Eu.

Fleischeri. To 8 in.: lvs. lanceolate to linear-lanceolate: fls. deep purple, in few-fld. panicles. Eu.

Hectori. Sts. decumbent and rooting but becoming erect to 6 in. high: lvs. small, mostly opposite, oblong, to ½ in. long: fls. about ¼ in. diam., in upper axils. New Zeal.

hirsutum. Per. to 4 ft., hairy: lvs. usually opposite, lanceolate, to 3 in. long: fls. purple, 1 in. across, solitary or in short racemes. Eu.; nat. in E. U. S.

Hornemanni. Erect to 12 in., simple or nearly so: lvs. ovate or elliptic, nearly or quite entire, to 1½ in. long: fls. purple, about ¼ in. across, in upper axils. N. N. Amer., Eurasia.

Lamyi. Depauperate bien., stoloniferous, with low branched st.: lvs. lanceolate, small-toothed, rosulate in autumn: fls. purple, funnelform. Eurasia.

lineare: name of doubtful application.

nummularifolium. Creeping and tufted, the sts. to 8 in. long: lvs. opposite, orbicular, to ½ in. long: fls. pink or whitish, ⅙ in. across, axillary. New Zeal.

obcordatum. Sts. decumbent, to 6 in. long: lvs. opposite, ovate, to ¾ in. long: fls. rose-purple, the petals to ¾ in. long, few in axils. Mts. Calif., Nev.

obscurum. Very low per., stoloniferous: lvs, lanceolate, remotely small-toothed, sessile: fls. small. purple, funnelform. Eurasia.

parviflorum. Erect per. to 1 or 2 ft., soft-pubescent, rosulate at base: lvs. lanceolate, dentate, sessile: fls. very small, purple or white. Eurasia.

rosmarinifolium: *E. Dodonæi.*

rubescens. Stoloniferous per. to 1½ ft., simple, hairy above: lvs. lanceolate, sharply acute, 1½ in. long: fls. white, small. Colo., Utah.

EPIMEDIUM. *Berberidaceæ.* Low per. herbs of the north temp. zone, with small pinnate lvs. and dainty racemes of small fls. in red, pink, white, yellow; the outer colored parts are interpreted as sepals, and the 4 inner ones as petals which are usually nectaries and sometimes produced into prominent spurs. The species and vars. are confused in cult. and plants may not belong to the names they bear; the various white-fld. kinds are probably *E. Musschianum*, and *E. macranthum* appears to be little grown at present.

The plants are very suitable for rock-gardens and semi-shady locations. In sheltered spots under trees the foliage often remains all winter and leaves persist when dead. Any usual soil is satisfactory. Propagated by division.

album: hort. name for a pure white form.

alpinum. To 1 ft.: lvs. biternate: fls. red with yellow slipper-like nectaries and short spurs. Eu. Cult. apparently only in var. **rubrum** (*E. rubrum*) with larger fls. and petals red outside and lvs. red-margined. May–June.

bicolorum: hort. form with rosy-brown fls., probably of *E. alpinum.*

coccineum: hort. form with red and white fls.

colchicum: *E. pinnatum* var.

diphyllum: *Aceranthus diphyllus.*

elegans: *E. pinnatum* var.

erectum: hort. name for a form with white fls.

macranthum. Long-spur E. To 9 in.: lvs. triternate: outer sepals red, inner petals violet with white deflexed prominently projecting spurs 1 in. long, May–June. Japan. Var **niveum** (*E. niveum*), fls. pure white; var. **roseum** (*E. roseum*), pinkish or pale rosy-red; var. **violaceum** (*E. violaceum*), spurs violet.

Musschianum. Japanese E. Lvs. 1-ternate: fls. white or pale yellow, drooping, spurs or sacs very short and not prominent. Japan.

niveum: *E. macranthum* var., at least in part.

pinnatum. Persian E. Lvs. usually biternate: fls. bright yellow with short red spurs or nectaries, Apr.–July. Persia, Caucasus. Var. **colchicum**, Golden-Fleece E., fls. brilliant yellow; var. **elegans**, June–Aug., larger and more numerous fls. than type.

roseum: *E. macranthum* var.

rubrum: *E. alpinum* var.

sulphureum: hort. name, probably form of *E. pinnatum.*

violaceum: *E. macranthum* var.

EPIPACTIS (*Goodyera. Peramium*). *Orchidaceæ.* Terrestrial orchids with basal usually variegated lvs. and fls. in spikes, the dorsal sepal and petals united into a helmet, lip entire; grown in shady places out-of-doors. See *Orchids.*

decipiens (*E. Menziesii*). To 1 ft.: lvs. to 2 in. long, dark green veined with white: fls. white, in dense one-sided spikes, in summer. N. Amer.

gigantea: *Amesia gigantea.*

Menziesii: *E. decipiens.*

pubescens. Rattlesnake Plantain. To 16 in.: lvs. to 2 in. long, dark green with white middle nerve and yellowish side nerves: fls. yellowish-white, in dense cylindrical spikes, in summer. E. N. Amer.

repens. To 10 in.: lvs. to 2 in. long, dark green indistinctly marked with lighter green: fls. snow-white, in dense one-sided spikes, July–Sept. N. Eu., N. Asia, N. Amer.

tesselata. To 1 ft.: lvs. about 2 in. long, bright green marked with white: fls. whitish, in loosely spiral spikes, July–Sept. E. N. Amer.

EPIPHRONITIS. *Orchidaceæ.* A group comprising hybrids between the genera Epidendrum and Sophronitis.

Veitchii (*E. radicans* × *S. grandiflora*).

EPIPHYLLANTHUS. *Cactaceæ.* Forking plants with thick globular, cylindric or flattened joints not toothed and bearing areoles all around, often epiphytic, with or without spines: fls. irregular, slender, purple to white, stamens more or less exserted. Cent. Brazil, 3 species. See *Cacti.*

microsphæricus (*Cereus obtusangulus*). At first erect, becoming much branched and more or less prostrate, joints slender and terete or obtusely angled, somewhat spiny or nude: fls. terminal, purple to rose.

EPIPHYLLUM (*Phyllocactus*). *Cactaceæ.* Mostly epiphytic cacti, branches usually flattened and leaf-like and sometimes 3-winged; mostly no spines on mature plants: fls. large and showy, with many long stamens, white, red or yellow, nocturnal or diurnal. Some 16 species, as now understood, Mex. and southward, some of them known as house plants; there are a number of hybrids. See *Cacti.*

The epiphyllums are very useful as greenhouse and window-garden subjects and are frequently seen in summer on porches. They propagate readily by cuttings and are of simple requirements.

Ackermannii. Sts. several, to 3 ft., flat, thin and crenate: fls. very large, to 8 in. long, scarlet outside and carmine within. Mex., but supposed to be a hybrid.

anguliger. Branches many, the lower ones terete, but upper ones flattened and deeply toothed: fls. brownish-yellow outside and otherwise white, tube about 3 in. long and segms. about 2 in. Mex.

biforme: *Disocactus biformis.*

crenatum. Sts. about 3 ft. long, terete, becoming woody, strongly crenate, branches glaucous and often tip-rooting: fls. 4 in. and more across and tube of similar length, very fragrant, cream-colored or greenish-yellow. Honduras, Guatemala.

Hookeri. Sts. 6–10 ft. long and more, joints rather thin and deeply crenate and 2–3 in. or more broad: fls. scentless, nocturnal, 8–9 in. long, yellow outside, petals white. Trinidad, Venezuela.

latifrons: *E. oxypetalum.*

Makoyanum: *Schlumbergera Gaertneri.*

oxypetalum (*E. latifrons*). Stout, to 10 ft. or more, with many thin flat branches to 4 in. or more broad and deeply crenate: fls. opening in evening and in full bloom about midnight, to 10 in. long, white, reddish outside, style white. Mex. to Brazil.—Much cult.

phyllanthoides: *Nopalxochia phyllanthoides.*

roseum: garden name, perhaps of a hybrid.

Russellianum: *Schlumbergera Russelliana.*

stenopetalum. Like *E. oxypetalum* (*latifrons*) but ultimate joints not acuminate as in that species: fls. fragrant, nocturnal but remaining open in morning, about 10 in. long, white, reddish outside, style pink or purplish. Mex.

strictum. Plant to 6 or 7 ft. or more, joints 2–3 in. broad and serrate: fls. opening at night and closing before dawn, white, brownish or pinkish outside, tube 6 in. long, sepals recurved. Mex. to Panama.

truncatum: *Zygocactus truncatus.*

EPIPHYTE: air-plant; a plant growing on another or on some other elevated support.

EPISCIA. *Gesneriaceæ.* Trop. American herbs with opposite often unequal lvs., scarlet, whitish or purple fls. with frequently spurred corolla-tube and 5-lobed limb, and leathery frs. opening by 2 valves; grown under glass and for hanging-baskets and in pyramids; require partial shade; propagated by cuttings or division of sts.

chontalensis. Sts. to 10 in. long, reddish-purple: lvs. ovate, to 4 in. long, marked with purple between veins: fls. pale lilac or white, to 2 in. across, solitary or clustered. Nicaragua.

cupreata. Sts. rooting at joints, drooping: lvs. oval, wrinkled and soft-hairy, tinged with copper or red: fls. scarlet, ¾ in. across, solitary. Nicaragua. Var. viridifolia has fls. to 1 in. across and green lvs.—The best known species in cult.

fulgida. Pubescent creeper: lvs. ovate, margins ciliate, rich dark green: fls. bright red, 1½ in. long, solitary. N. S. Amer.

metallica: hort. name, perhaps for a form of *E. cupreata.*

tessellata (*Centrosolenia bullata*). Pubescent, of robust habit: lvs. to 1 ft. long and 6 in. wide, bronzy-green, veined with purple, and elevated between veins, wavy and ciliate: fls. pale yellow, about 2 in., long, in clusters. Peru.

EPITHELANTHA. *Cactaceæ.* One very small globular cactus from W. Tex. and N. Mex. For cult. see *Cacti.* **E. micromeris** (*Mammillaria micromeris*). Simple or cespitose, about 2¼ in. or less diam., depressed at top, tubercles small in many spirals, spines many and white: fls. near center of plant among wool and spines, whitish to light pink, about ¼ in. across.

EQUISETUM. HORSETAIL. *Equisetaceæ* (the only genus). Per. rush-like cryptogamous herbs with hollow jointed sts. and no proper foliage; lvs. reduced to sheaths at the joints; spores borne in terminal cone-like spikes; widely distributed and rarely transplanted in moist locations.

hyemale. Evergreen, to 4 ft., sts. slender, furrowed and rough: spikes pointed. N. Amer., Eu., Asia.

præaltum (*E. robustum*). Evergreen, to 11 ft., sts. furrowed and rough: spikes with stiff point. N. Amer., Asia.—Other species may be transferred to grounds.

robustum: *E. præaltum.*

ERAGROSTIS. *Gramineæ.* Small or medium-sized ann. and per. grasses widely distributed in trop. and temp. countries, the small spikelets borne in open diffuse panicles; a few species are planted for the ornament of their delicate spray. See *Grasses.*

abyssinica. TEFF. Ann. to 3 ft.: lvs. to 6 in. long and 1/12 in. wide: panicles 1 ft. or more long, with long hair-like ascending branches. N. Afr.

amabilis. Ann. to 1 ft.: lvs. to 4 in. long and ⅙ in. wide: panicles to 6 in. long, with slender spreading or ascending branches. India.—Some of the material cult. under this name is *E. suaveolens.*

capillaris. Ann. to 1½ ft.: lvs. to 10 in. long and ⅙ in. wide, rough above: panicles to 15 in. long, with hair-like spreading or ascending branches. N. H. to Ga. and Tex.—Some of the material cult. as *E. capillaris* is *E. mexicana.*

chloromelas. Tufted per. to 1½ ft.: lvs. to 6 in. long and 1/12 in. wide, convolute, glaucous: panicles to 8 in. long, stiff, with slender spreading branches. S. Afr.

curvula. Tufted per. to 2 ft.: lvs. to 1 ft. long and 1/12 in. wide, convolute: panicles to 10 in. long, with slender branches erect or spreading. S. Afr. Var. valida has lvs. to 2 ft. long and ¼ in. wide.

elegans: *E. japonica.*

interrupta: *E. japonica.*

japonica (*E. elegans. E. interrupta*). Ann., erect, to 3 ft.: panicles narrow, somewhat interrupted, comprising about half the entire height with numerous minute spikelets. Japan.

maxima. Ann. to 3 ft.: lvs. lanceolate: panicles to 9 in. long, with hair-like branches. Madagascar.—Plants grown under this name may be *E. suaveolens.*

mexicana. Ann. to 2 ft.: lvs. to 8 in. long: panicles to 1 ft. long, the branches slender and spreading. S. Calif. to New Mex. and Mex.

obtusa (*Briza geniculata*). Tufted per. to 1½ ft.: lvs. to 5 in. long and 1/12 in. wide, usually involute: panicles to 4 in. long, with thread-like spreading branches. S. Afr.

pilosa (*Poa pilosa*). Tufted ann. to 1½ ft.: lvs. to 5 in. long and 1/12 in. wide: panicles to 6 in. long, branches spreading. Eu.; nat. in N. Amer.

suaveolens. Ann. to 3 ft., resembling *E. abyssinica* but with less spreading panicles and more compact spikelets. W. Asia.

unioloides. Ann., erect or spreading, to 1 ft.: panicle ovoid and open, to 6 in. long, the spikelets usually pink or purplish and somewhat like those of a Briza. India, Malaysia, China.

ERANTHEMUM (*Dædalacanthus*). *Acanthaceæ.* Trop. Asian herbs and shrubs with opposite simple lvs. and blue or rose tubular 5-lobed fls. in dense bracted spikes; one species grown in S. Fla. and under glass. It thrives in light rich soil with ample sunlight and water. Propagated by cuttings of young wood.

atropurpureum: *Pseuderanthemum atropurpureum.*

bicolor: *Pseuderanthemum bicolor.*

Eldorado: a form of *Pseuderanthemum atropurpureum.*

nervosum (*E. pulchellum*). To 4 ft.: lvs. ovate or oval, to 8 in. long, prominently veined, slightly toothed: fls. blue, 1 in. long and ¾ in. across, under pointed veiny bracts. India.—Commonly planted far S. and frequent under glass.

pulchellum: *E. nervosum.*

reticulatum: *Pseuderanthemum reticulatum.*

tuberculatum: *Pseuderanthemum tuberculatum.*

ERANTHIS. WINTER ACONITE. *Ranunculaceæ.* Small per. herbs with short tuberous root, native in Eu. and Asia, having basal palmately dissected lvs., solitary yellow vernal fls. subtended by an involucre-like lf., and fr. composed of many follicles. They are very hardy and thrive in most situations. Propagated by division of roots.

cilicica: *E. hyemalis* var.

hyemalis. To 8 in.: lvs. long-stalked, 1½ in. across, cut into many linear or oblong segms.: fls. to 1½ in. across, with 5–9 petal-like sepals, in very early spring. Eu.; somewhat nat. in N. Amer. Var cilicica (*E. cilicica*) has broader sepals ½ in. across.—Tubers may be planted in autumn as for tulips; plants are likely to persist.

sibirica. Similar to *E. hyemalis* but only 3–4 in. high, with smaller fls. having 5 sepals. Siberia.

ERCILLA. *Phytolaccaceæ.* Climbing evergreen shrubs with alternate entire lvs., pale purple fls. in many-fld. axillary racemes, and fr. a berry; sometimes grown in warm regions or under glass as a wall-cover as it climbs by aerial rootlets. Propagated by seeds and cuttings.

spicata (*Bridgesia spicata*). Lvs. leathery, elliptic or ovate, to 3 in. long and 1½ in. wide: racemes slightly longer than lvs.: berries dark purple. Chile.

EREMÆA. *Myrtaceæ.* W. Australian shrubs, some of them intro. in Calif., differing from Calothamnus chiefly in the fls. solitary or few and nearly terminal rather than in lateral clusters or spikes: lvs. heath-like, flat, alternate, often crowded: stamens longer than petals and showy, the fls. red.

ebracteata. Low bush, young parts somewhat hirsute: lvs. ⅓ in. or less long, linear: fls. 1–3 at a place, with few small bracts or none.

fimbriata. Stiff coarse shrub, more or less hirsute: lvs. ½ in. or less long, lanceolate or elliptic: fls. solitary, surrounded by bracts.

violacea. Hirsute shrub with nearly cylindrical linear acute lvs. and solitary twin or sometimes clustered fls. bearing violet filaments that are joined near the base.

EREMOCHLOA. *Gramineæ.* Per. grasses of Asia and Australia, with one-sided spikelets borne in terminal narrow spikes; one species grown for lawns in the S. See *Grasses.*

ophiuroides. CENTIPEDE-GRASS. Creeping by runners and stolons: lvs. about 3 in. long and ¼ in. wide, bluish- or yellowish-green: racemes straight or somewhat falcate, cylindric and slender, glabrous, to 2½ in. long. China.

EREMOCITRUS. AUSTRALIAN DESERT KUMQUAT. *Rutaceæ.* One species, **E. glauca,** in desert regions of subtrop. Australia, in this country resistant to cold and drought and promising beyond the regular citrus belt. It is a sharp-spiny shrub or small tree with very narrow xerophytic lvs. to 1½ in. long: fls. small, white, fragrant, solitary or 2 or 3 together in the axils: fr. light yellow, pyriform or oblate, about ½ in. diam., commonly 4-celled, mildly acid and edible. Works as a graft on Citrus, and vice-versa.

EREMOSTACHYS *Labiatæ.* Asian herbs with mostly basal toothed or cut lvs. and yellow 2-lipped fls. in many-fld. whorls in spikes; one species is known to hort.

laciniata. To 2 ft. or more, hairy: lvs. 2-pinnate into lanceolate or linear segms.: fls. yellow or cream-colored, in spikes to 2 ft. long. Asia Minor.

EREMURUS. DESERT-CANDLE. *Liliaceæ.* Asian per. herbs with thick fibrous or cord-like roots, narrow basal lvs. forming tufts or rosettes and white, pink or yellow fls. in racemes terminating stately scapes usually several ft. high, the perianth-segms. almost distinct.

These plants are hardy in the North with winter protection. They are good in rich well-drained soil. Propagated by division or slowly by seeds. They are seen to good advantage against a background of foliage.

Bungei. Lvs. linear, 1 ft. long: fls. yellow or orange, in racemes to 5 in. long. Persia.

Elwesii. Lvs. ovate-lanceolate, glaucous: fls. pink with deeper band down center. Habitat unknown. Var. **albus** is listed.

himalaicus. Lvs. strap-shaped, to 1½ ft. long: fls. white, in racemes to 2 ft. long and 4 in. through. Himalayas.—The commonest species in cult.

Olgæ. Lvs. narrow, to 1 ft. long and ¾ in. or less broad, rough on margins: fls. white with brownish midnerves, in a dense raceme. Turkestan. Var. **albus** has white fls.

robustus. Lvs. narrow-strap-shaped, to 2 ft. long, glaucous: fls. bright pink, in racemes to 3 ft. long and 5 in. through. Cent. Asia.

Shelfordi. A hort. form with coppery-yellow fls. tinged outside with red.

turkestanicus. Fls. reddish-brown margined with white, in racemes to 2 ft. long. Turkestan.

Tubergenii. Hybrid between *E. himalaicus* and *E. Bungei.*

Warei. Probably hybrid between *E. Bungei* and *E. Olgæ.*

EREPSIA. *Aizoaceæ.* Separated from Mesembryanthemum (which see for cult.): per., more or less woody, branches erect or ascending: lvs. opposite, 3-angled, sometimes serrate or toothed: fls. solitary or ternate, whitish, yellow or reddish; stamens hidden under staminodes. S. Afr.

heteropetala (*M. heteropetalum*). Lvs. somewhat compressed or flattened but 3-angled, glaucous, rough or cut on the keel, about 1 in long: fls. small, solitary, pale red or whitish, the petals unequal and shorter than calyx.

inclaudens (*M. inclaudens*). Lvs. somewhat flattened and 3-angled, scimitar-shaped, with wide keel, green, 1 in. or less long, essentially entire: fls. rose or purplish, with broad petals, inner ones very short.

mutabilis (*M. mutabile*). Lvs. to ¾ in. long, green, acute, keel entire: fls. rose, petals narrow or subulate, a little longer than calyx.

serrata (*M. serratum*). Erect: lvs. subulate, to ⅓ in. long, serrate on angles or keel: fls. yellow with purple lines, petals shorter than calyx.

ERIA. *Orchidaceæ.* Trop. Asian epiphytes of various habit and fls. in racemes or panicles, the sepals forming with the column a spur or sac-like body; subjects for the warm greenhouse. See *Orchids.*

ancorifera. Similar to *E. flava* but with black anchor-shaped mark on lip. Sumatra.

barbata. Pseudobulbs to 2 in. long, with 2 lvs. to 16 in. long: fls. yellow striped with brownish-purple, in hairy racemes to 5 ft. high, Oct.–Nov. India.

bractescens. Pseudobulbs 2 in. long, with 2–3 lvs. to 5 in. long: fls. white with lip purplish at base, in many-fld. racemes to 6 in. long, June. E. Indies.

convallarioides. Pseudobulbs 3½ in. long, with 3–4 lvs. to 7 in. long: fls. white with yellow lip, about ⅓ in. across, in drooping racemes about 1¾ in. long, May–June. Himalayas.

coronaria (*Trichosma suavis*). Pseudobulbs 6 in. long, with 2 lvs. to 7 in. long: fls. white with yellow lip, the side lobes marked with purple, in 3–5-fld. racemes to 6 in. long, Dec.–Mar. Himalayas.

densiflora: a listed name.

excavata. Pseudobulbs to 2 in. long, with 4–6 lvs. to 6 in. long: fls. white with yellow lip veined with purple and pink side lobes, in few-fld. racemes. Himalayas.

ferruginea. Pseudobulbs to 8 in. long, with 2–4 leathery lvs. to 6 in. long: fls. about 1 in. across, in 8–14-fld. racemes to 8 in. long; sepals olive-brown striped with darker color; petals white tinged with rose; lip white, bright rose within, Mar.–May. Himalayas.

flava. Pseudobulbs to 3 in. long, with 3–5 lvs. to 10 in. long: fls. yellow marked with purple, the scapes white-tomentose. Himalayas. Var. **lanata** (*E. lanata*) has smaller fls. with purplish midlobe of lip.

lanata: *E. flava* var.

monostachya. Lvs. linear: fls. in long cylindrical racemes. Java.

obesa. Pseudobulbs to 3 in. long: fls. white, greenish-yellow at base, in 4–6-fld. racemes, Feb.–Mar. Burma.

ERIANTHUS. PLUME-GRASS. *Gramineæ.* Robust per. grasses, sometimes grown as annuals, with long flat lvs. and spikelets with tufts of silky hairs at their base, borne in large terminal panicles; native in warm and temp. regions and ornamental as specimen plants. See *Grasses.*

alopecuroides: *E. divaricatus.*

divaricatus (*E. alopecuroides*). Per. to 10 ft.: panicle oblong, to 1 ft. and to 3 in. broad, the branches slender and loose. N. J. to Fla. and Tex.

Ravennæ. RAVENNA-GRASS. To 12 ft.: lvs. to 3 ft. long and ½ in. and more wide, midrib paler: panicles to 3 ft. long, silky, dense and plume-like. S. Eu. to India.

saccharoides. To 10 ft.: lvs. to 2 ft. long and 1 in. wide: panicles 1 ft. or more long, loose. N. J. to Fla. and Tex., Cuba.

ERICA. HEATH. *Ericaceæ.* Evergreen branchy shrubs or sometimes small trees, in very many species, with small needle-like or very narrow usually whorled lvs., small white, rose or yellow usually declined fls. that are mostly tubular, bell-shaped, urn-shaped, or globose, and capsular frs.; native in Eu. and S. Afr., particularly abundant in the latter country. Many Latin-named kinds occur in collections of fanciers, often representing variants and hybrids.

Heaths are grown somewhat in rock-gardens, but few of them are hardy in the North, also under glass for the profuse bloom. They are plants of attractive compact habit and slow growth. *E. carnea* and *E. vagans* are perhaps hardiest, standing in New York and central New England, but *E. cinerea* and *E. Tetralix* are nearly equally durable, and *E. scoparia* stands in middle regions. Heaths of many kinds are profuse bloomers and popular in the open in California, where they bloom in winter and early spring. They are particular as to soil in pot culture, preferring one of light peat and coarse sand. In the open, they are given a light or sandy soil; they do not stand well in limestone soils. Propagated by cuttings of young wood under glass, given good ventilation when rooted. New blooming wood may be produced by heading back after flowering.

abietina: see note under *E. Patersoni.*

arborea. TREE H. To 20 ft.; the sts. with long stout hairs: lvs. in 3's, glabrous: fls. white, ⅛ in. long, fragrant, in large panicles in winter or spring. Medit. region.

australis. To 4 ft.: lvs. in 4's, glabrous: fls. purplish-red, ⅓ in. long, in terminal clusters in spring. Spain, Portugal.

baccans. To 5 ft., erect, glabrous: lvs. in 4's, somewhat curved: fls. terminal in 4's, purple, the corolla narrowed at throat, about ¼ in. long. S. Afr.

Bergeriana (*E. turrigera*). To 3 ft.: lvs. in 4's, rough, ciliate: fls. red, to ¼ in. long, in 4's, May–June. S. Afr.

blanda: *E. doliiformis;* the material cult. under the name *E. blanda* may be of hybrid origin.

Bowieana. To 1 ft.: lvs. in 4's, glabrous: fls. white, tubular, to ¾ in. long, axillary. S. Afr.

caffra (*E. urceolaris*). To 12 ft.: lvs. in 3's, gray-pubescent: fls. white or yellowish-white, ¼ in. long, in few-fld. clusters. S. Afr.

capitata. To 15 in., branches more or less woolly: lvs. in 3's, obtuse, woolly underneath: fls. 1–3, greenish-yellow, globular, ¼ in. or less across. S. Afr.

carnea. To 1 ft., the branches prostrate: lvs. in 4's, glabrous: fls. red, to ¼ in. long, in one-sided racemes to 2 in. long in early spring, the stamens exserted. Eu. Var. **alba** has white fls.—Other forms bear hort. names.

Cavendishiana. Hybrid between *E. depressa* and *E. Patersoni*: fls. yellow, tubular.

cerinthoides. To 3 ft.: lvs. in 4's–6's, pubescent and ciliate: fls. crimson or pink, tubular, to 1⅓ in. long, in umbels. S. Afr.

Charlesiana, Charlesworthiana: listed as a hybrid: fls. pale pink, tubular, ½ in. long.

ciliaris. FRINGED H. To 1 ft., the branches prostrate: lvs. in 3's, ciliate: fls. rosy-red, ⅓ in. long, in terminal racemes to 5 in. long from July–Oct. W. Eu.

cinerea. TWISTED H. To 1½ ft., much branched: lvs. in 3's, glabrous: fls. rosy-purple, ¼ in. long, in umbels or racemes to 3 in. long, June–Sept. W. Eu. Var. **alba** has white fls. and **coccinea** red.

codonodes: *E. lusitanica.*

concinna: *E. verticillata.*

cruenta. Erect, to 3 ft.: lvs. in 3's, pubescent when young: fls. blood-red, to 1 in. long, more or less tubular. S. Afr.

darleyensis (*E. mediterranea hybrida*). Hybrid between *E. carnea* and *E. mediterranea:* to 2 ft.: fls. red, ¼ in. long.

depressa. Branches decumbent, with revolute lvs. in 3's: fls. white, small, terminal. S. Afr.

doliiformis (*E. blanda*). To 1 ft.: lvs. in 6's, glabrous, ciliate: fls. rosy, tubular, ½ in. long, in umbels. S. Afr.

glandulosa. Erect, to 2 ft. or more: lvs. in 4's: fls. in 4's, white, corolla nearly tubular, usually pubescent or glandular, about 1 in. long. S. Afr.

gracilis. To 1 ft.: lvs. in 4's, glabrous: fls. rosy, ⅙ in. long, in whorls of 4 at ends of branchlets, Feb.–Mar. S. Afr. Var. **autumnalis** blooms in fall.

grandiflora. Stout and erect, to 5 ft.: lvs. scattered or in 6's: fls. orange-red to bright yellow, corolla narrowed to base, about 1 in long, S. Afr.

Hieliana: see *E. hyemalis.*

hirtiflora. To 2 ft.: lvs. in 4's, hairy: fls. pale purple, ⅙ in. long, rough-hairy, in 4's. S. Afr.

hyemalis (*E. Hieliana?*). To 2 ft.: lvs. in 4's, ciliate: fls. pink tipped with white, to 1 in. long, borne along the branchlets and forming a leafy raceme, Nov.–Feb. Origin unknown.

linnæoides. Supposed hybrid: fls. mostly in 4's, corolla clavate, white in upper part, purple at base.

lusitanica (*E. codonodes*). SPANISH H. To 12 ft.: lvs. in 3's–5's or irregular, glabrous: fls. pink or white in var. **alba**, ⅙ in. long, profusely borne along branches from Feb.–Apr. W. Eu.

Mackaii (*E. Mackaiana*). Hybrid between *E. Tetralix* and *E. ciliaris:* fls. red, ¼ in. long. Var. **plena** (var. *flore-pleno*) has double fls.

mediterranea. To 10 ft.: lvs. in 4's–5's, glabrous: fls. deep red, to ¼ in. long, in short racemes in spring, the stamens exserted. W. Eu. Var. **alba** has white fls. Var. **hibernica** (var. *glauca*), to 3 ft., lvs. glaucous.

melanthera. To 2 ft.: lvs. in 3's, glabrous: fls. rosy, ⅙ in. long, blooming profusely at ends of branches in winter, the stamens exserted. S. Afr. Color forms are **purpurea** and **rubra.**

multiflora. To 3 ft.: lvs. in 5's or 6's, glabrous: fls. pink, ⅕ in. long, in dense spikes, the stamens exserted. S. Eu.

Patersoni. The trade name probably belongs to *E. abietina*, which is an erect glabrous bush to 2 ft. high, imbricated lvs. to ½ in. long, and fls. yellow with orange limb. S. Afr.

persoluta: *E. subdivaricata.*

regerminans. To 2 ft.: lvs. in 6's, glabrous: fls. pink or red, ⅙ in. long, in dense spikes to 5 in. long. S. Afr.—The plants usually cult. under this name are *E. hirtiflora.*

scariosa. Erect, to 1½ ft.: lvs. crowded and mostly on short branchlets: fls. solitary, terminal, white or rosy, corolla tubular and inflated, about ⅓ in. long. S. Afr.

scoparia. BESOM H. To 10 ft.: lvs. in 3's or 4's, glabrous and shining: fls. greenish, 1/12 in. long, in long spikes, May–June. S. Eu. Var. **pumila** is a dwarf form.

sessiliflora. Erect, to 1½ ft., very leafy: lvs. scattered or in 6's: fls. in dense spike, bracts and sepals light colored or red, corolla greenish or yellowish, trumpet-shaped, about 1 in. long. S. Afr.

stricta. CORSICAN H. To 9 ft., with stiff branches: lvs. mostly in 4's, glabrous: fls. rosy-purple, ¼ in. long, in terminal umbels in summer. S. Eu.

subdivaricata (*E. persoluta*). To 2 ft.: lvs. in 4's, glabrous: fls. rosy (var. **rosea**) or white (var. **alba** or **albiflora**), ⅙ in. long, in racemes in spring. S. Afr.

Tetralix. To 2 ft., the branches prostrate: lvs. in 4's, ciliate, whitish beneath: fls. rose, ¼ in. long, in dense terminal clusters, June–Oct. Eu. Var. **alba** has white fls.

translucens. Hybrid between *E. tubiflora* and *E. ventricosa:* fls. rosy, ¾ in. long, tubular.

tubiflora: a name variously applied to several species.

turrigera: *E. Bergeriana.*

urceolaris: *E. caffra.*

vagans. CORNISH H. To 1 ft.: lvs. in 4's or 5's, glabrous: fls. purplish-pink, ⅛ in. long, in leafy racemes to 6 in. long, the stamens exserted. W. Eu. Var. **alba** has white fls. and **rubra** deeper red. Var. **grandiflora** has larger fls.—There are forms with hort. names.

Veitchii. Hybrid between *E. arborea* and *E. lusitanica*: fls. white, borne profusely.

ventricosa. To 6 ft.: lvs. in 4's, ciliate: fls. white, pink or red, to ⅜ in. long, in dense umbels in spring and summer. S. Afr. Var. **grandiflora** has larger fls.

verticillata (*E. concinna*). To 5 ft.: lvs. mostly in 4's–6's, glabrous: fls. rosy, tubular, ¾ in. long, forming dense leafy racemes. S. Afr.

viridipurpurea. To 2 ft.: lvs. in 4's, glabrous: fls. red, 1/12 in. long, in clusters. S. Afr.

vulgaris: *Calluna vulgaris.*

Webbiana: supposed hybrid.

Williamsii. Hybrid between *E. Tetralix* and *E. vagans:* fls. rose, urn-shaped.

Wilmorei (*E. Wilmoreana*). Said to be a hybrid: fls. rosy tipped with white, tubular.

ERICACEÆ. HEATH FAMILY. Widely distributed hardwood shrubs and small trees with simple lvs., bisexual fls. mostly showy, with 4–5-parted calyx, 4–5-lobed gamopetalous corolla, 4–10 stamens, superior or inferior 2–5-celled ovary and 1 style, and fr. a caps., berry or drupe. The family furnishes many ornamental subjects and some, as the blueberry, grown for the edible frs. Some members of the family are the choicest broad-leaved evergreens. They are prevailingly plants of acid soils. Genera known to hort. are Andromeda, Arbutus, Arctostaphylos, Arctous, Befaria, Bruckenthalia, Calluna, Chamædaphne, Chimaphila, Chiogenes, Daboëcia, Elliottia, Enkianthus, Epigæa, Erica, Gaultheria, Gaylussacia, Kalmia, Ledum, Leiophyllum, Leucothoë, Loiseleuria, Lyonia, Menziesia, Oxydendrum, Pentapterygium, Pernettia, Phyllodoce, Pieris, Pyrola, Rhododendron, Rhodothamnus, Vaccinium, Zenobia.

ERICAMERIA. *Compositæ.* Evergreen shrubs often with heath-like foliage and yellow heads in terminal panicles or cymes, with or without rays; pappus of bristles; native in W. N. Amer. and sometimes planted.

ericoides (*Aplopappus ericoides*). MOCK-HEATHER. To 2½ ft.: lvs. crowded, cylindrical, to ⅙ in. long: heads to ⅓ in. long, with rays. Calif.

ERIGENIA. *Umbelliferæ.* One tuberous nearly stemless per. herb, native Ont. to Minn. and Kans. **E. bulbosa.** HARBINGER-OF-SPRING. To 9 in.: lvs. ternately decompound into oblong obtuse segms.: fls. white, in small usually compound umbels.

ERIGERON. FLEABANE. *Compositæ.* Annuals and perennials of wide distribution, resembling wild asters: lvs. alternate or basal, entire or toothed or occasionally dissected: heads solitary or in clusters, rays mostly white, rose, violet or purple, disk-fls. yellow; pappus of soft bristles.

Erigerons are of easy cultivation in the border or wild-garden and for colonizing, and the low kinds in rock-gardens. Propagated by seeds, division or cuttings, the tufted perennial species best by division.

acris (*E. umbellatus*). Per. or bien. to 2 ft.: lvs. spatulate to oblong, entire: heads in racemes or panicles, ½ in. across, rays purple short, a row of thread-like pistillate fls. inside the rays. N. N. Amer.

alpinus. To 1 ft.: lvs. spatulate to linear, entire: heads usually solitary, ¾ in. across, rays purple varying to white. N. Eu., N. Asia, Rocky Mts.

aurantiacus. DOUBLE ORANGE DAISY. To 10 in.: lvs. spatulate-oblong: heads 1–2, about 1 in. across, rays orange-yellow. Turkestan.

bellidifolius: *E. pulchellus.*

caucasicus. Per. to 10 in.: lvs. spatulate or oblong: heads 1–3, 1 in. across, rays rosy-purple. Caucasus.

cilicicus: *E. uniflorus.*

compositus. To 8 in.: radical lvs. crowded, usually 2-ternate into linear or spatulate segms.: heads solitary, ¾ in. across, rays white or purplish. Alaska to Calif. and Rocky Mts.

Coulteri. Per. to 2 ft.: lvs. obovate to lanceolate, slightly toothed: heads usually solitary, to 1½ in. across, rays white to purplish. Rocky Mts. to Calif.

elatior (*E. grandiflorus elatior*). Per. to 2 ft.: lvs. ovate-lanceolate, entire: heads 1–3, to 1½ in. across, rays lilac or purple. Colo. to Wyo.

glabellus. Per. to 1½ ft.: lvs. oblanceolate to linear-lanceolate: heads 1–3, to 2 in. across, rays violet or purple. Wis. to Rocky Mts.

glabratus. Per. to 8 in.: lvs. spatulate: heads usually solitary, to ¾ in. across, bright purple to white. Eu. Var. **roseus** is listed.

glandulosus. Per. to 6 in.: lvs. mostly basal, oblanceolate: heads solitary, 1 in. across, rays violet or purple. Colo., Wyo. Var. **major** is listed.

glaucus. BEACH ASTER. SEASIDE DAISY. Per. to 10 in.: lvs. mostly basal, spatulate or oblong, entire: heads solitary, to 1½ in. across, rays lilac or violet. Pacific Coast.

grandiflorus. Per. to 8 in.: lvs. lanceolate, hairy: heads solitary, rays purple to white, ⅓ in. long, involucres white-woolly. Canadian Rockies.

hybridus: hort. name of uncertain application.

intermedius: hort. name, probably *E. speciosus.*

Karvinskianus (*E. mucronatus*). Per. but blooming first year from seed, to 18 in. and some or all of the branches decumbent and more or less trailing: lvs. to 1 in. long, more or less toothed or lobed at apex: heads on solitary peduncles. to ¾ in. across, rays many and white or pinkish. Mex. and south.—Grown as a border or bed plant, usually under the name *Vittadinia* (which see).

macranthus. Per. to 2½ ft.: lvs. oblanceolate to ovate: heads in corymbs, to 1½ in. across, rays very numerous, lilac or bluish-purple. Mts., Alta. to Ariz.

mexicanus: a listed name.

mucronatus: *E. Karvinskianus.*

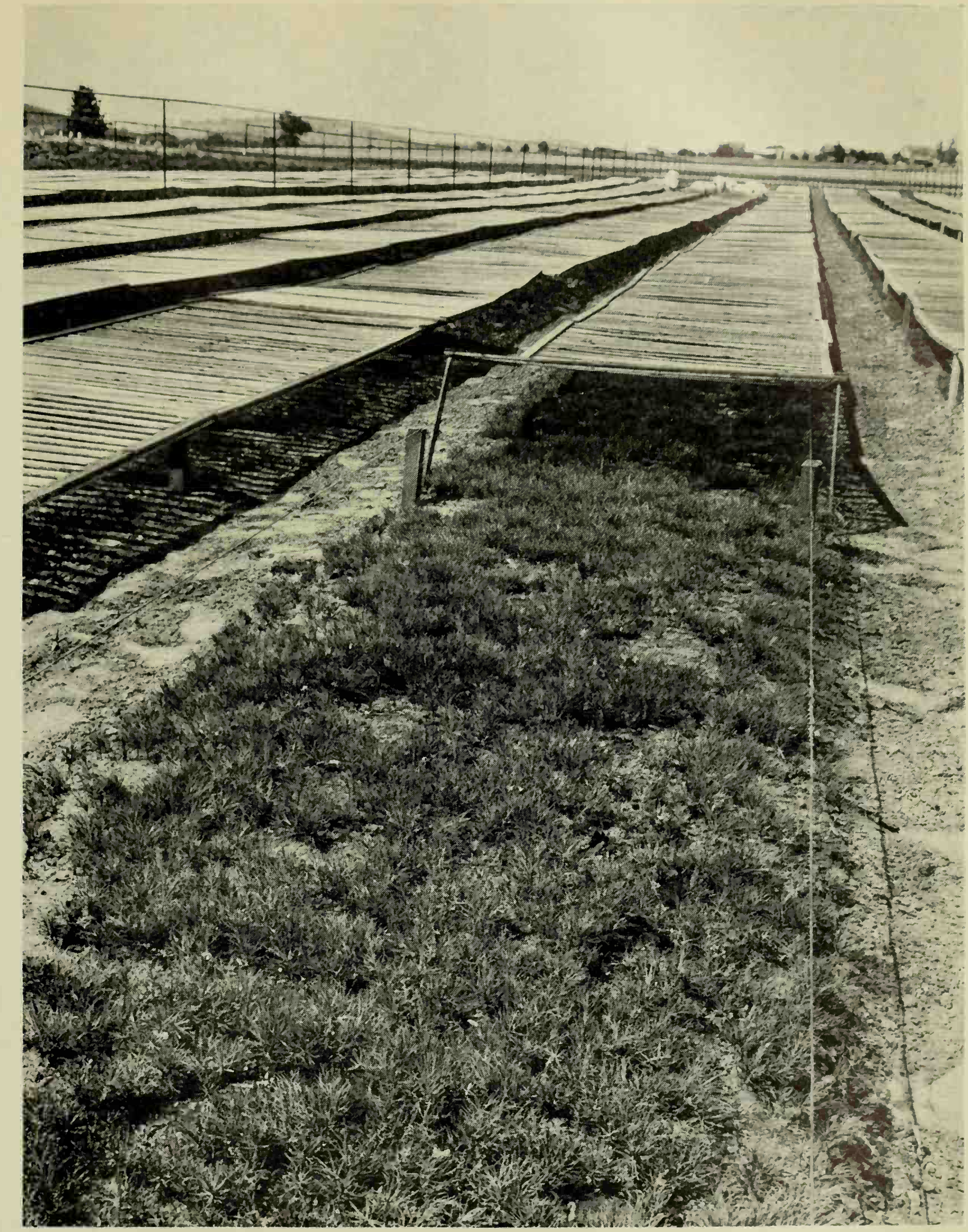
multiradiatus. HIMALAYAN F. From 6 in.–2 ft.: lvs. oblong or lanceolate, entire: heads solitary, to 3 in. across, rays very numerous, purplish. Himalayas. Var. **roseus** is listed.

philadelphicus. Per. by offsets, to 3 ft.: lvs. spatulate or oblong, toothed or entire: heads in corymbose clusters, to 1 in. across, rays purplish-white. N. Amer.

prostratus: listed name.

pulchellus (*E. bellidifolius*). POOR ROBINS PLANTAIN. Per. by offsets, to 2 ft.: basal lvs. tufted, spatulate, entire or toothed: heads 1–6, to 1½ in. across, rays violet or purplish. Me. to Fla. and La.

Roylei: an uncertain name, possibly *E. alpinus.*



VII. NURSERY. — Plantlets protected under lath screens; pine seedlings in foreground

salsuginosus. Per. to 1½ ft.: lvs. spatulate to lanceolate, entire: heads solitary, to 1¾ in. across, rays purple or violet. Alaska to Calif. and New Mex.

speciosus (*Stenactis speciosa*). Per. to 2 ft.: lvs. lanceolate to spatulate, entire: heads in corymbs, to 1½ in. across, rays very numerous, dark violet. B. C. to Ore. near the coast. Hort. vars. are **grandiflorus, major, roseus, semiplenus, superbus.**

trifidus. To 4 in.: lvs. basal, 3-cleft, segms. entire or 2–3-lobed: heads solitary, ½ in. across, rays white or pale lilac. Alaska to Rocky Mts.

umbellatus: *E. acris.*

uniflorus (*E. cilicicus*). To 4 in.: lvs. spatulate to linear, basal tufted: heads solitary, ¾ in. across, rays purple or sometimes white. Arctic regions.

ERINUS. *Scrophulariaceæ.* A hardy tufted per. 3–4 in. high suitable for the steeper parts of the rock-garden and for margins; native in the mts. of W. and Cent. Eu. Erinus should be planted in partial shade and where there is exceptionally good drainage. Propagated by seed or by division. **E. alpinus.** Lvs. spatulate, to ½ in. long, coarsely toothed: fls. ½ in. across, purple, 5-lobed, in racemes 2½ in. long. Vars. **albus** and **carmineus** are color forms. Var. **hirsutus** has hairy foliage.

ERIOBOTRYA. *Rosaceæ.* Several Asian evergreen trees and shrubs with alternate simple sessile lvs., white fls. in terminal panicles, and fr. a small pome; one is grown far S. for ornament and the edible fr. and is sometimes seen under glass. For cult. see *Loquat.*

japonica (*Photinia japonica*). LOQUAT. To 20 ft.: lvs. thick and stiff, obovate, to 1 ft. long, shining above, rusty-tomentose beneath: fls. fragrant, ½ in. across, in woolly panicles to 6 in. long: fr. pear-shaped, yellow, to 1½ in. long. China.—Sometimes called "Japan-plum." In var. **variegata** the lvs. are variegated with white.

ERIOCEPHALUS. *Compositæ.* S. African branching aromatic shrubs, mostly silvery, one of which is intro. in Calif.: lvs. alternate or opposite or clustered, small and usually linear, simple or 3-parted: heads hairy-white and becoming woolly, with pistillate ray-fls. **E. africanus** has linear or 3-lobed thick silky lvs. to 1 in. long and heads umbelled at ends of branches.

ERIODENDRON ANFRACTUOSUM: *Ceiba pentandra.*

ERIOGONUM. *Polygonaceæ.* Herbs or subshrubs native in W. N. Amer. in many species of varied habit, with basal, alternate or whorled lvs. and fls. borne in involucres in heads or umbels or sometimes solitary along the branches; sometimes transplanted from the wild, and requiring sunny positions and well-drained soil.

annuum. Ann. to 3 ft., white-woolly: lvs. oblong, to 2 in. long: fls. white, in flat-topped cymes. S. D. to Tex.

fasciculatum. WILD BUCKWHEAT. To 3 ft., woody at base: lvs. clustered, oblong or linear, to ¾ in. long, densely white-woolly beneath: fls. white, in heads in simple or compound umbels. Calif., Nev.

giganteum. Shrub to 8 ft.: lvs. ovate, to 2½ in. long, white-woolly: fls. white-woolly, in heads in dense compound cymes. Santa Barbara Isls.

latifolium. Per. to 2 ft.: lvs. ovate to oblong, to 2½ in. long, densely white-woolly at least beneath: fls. white or pink, in dense heads to ¾ in. across. Calif.

marifolium. Per. to 1 ft.: lvs. oval or ovate, ½ in. long, white-woolly at least beneath: fls. yellowish, in umbels. Calif.

parvifolium. Shrub to 3 ft.: lvs. ovate to oblong, to ½ in. long, densely white-woolly beneath: fls. white or pink, in heads or umbels. Calif.

umbellatum. Per. to 1 ft.: lvs, basal, obovate or oval, to 2½ in. long, white-tomentose beneath: fls. deep yellow, in umbels. Wash. to Wyo. and Calif.

ERIOPHORUM. COTTON-GRASS. *Cyperaceæ.* Per. sedges native in bogs in the northern hemisphere, with linear lvs. and fls. with perianth of soft white or brown bristles giving a cottony appearance; sometimes planted along the edges of ponds or in bog-gardening for the cotton-like heads on stiffish sts.

angustifolium. To 2 ft.: lvs. to ⅓ in. wide, flat except the tip: spikelets 2–12, in terminal umbels, the white bristles 1 in. long. Eu., Asia, N. N. Amer.

latifolium. To 1 ft.: lvs. about ¼ in. wide, flat: spikelets several, in terminal umbels, the white bristles 1 in. long. Eu.

vaginatum. To 1½ ft., tufted: lvs. mostly reduced to sheaths: spikelets solitary, the numerous white bristles 1 in. long. Eu., N. Asia.

viridicarinatum. Differs from *E. angustifolium* in thinner lvs. and more numerous spikelets with white or yellowish-white bristles. N. N. Amer.

ERIOPHYLLUM. *Compositæ.* Ann. or per. herbs or subshrubs native in W. N. Amer., with alternate white-tomentose lvs. which are entire or divided, and heads of yellow ray- and disk-fls.; pappus of scales or lacking; sometimes placed in gardens in dry regions.

cæspitosum. Per. to 1½ ft.: lvs. deeply 3–5-lobed, to ¾ in. long, green above: heads usually solitary, to 1¼ in. across. Calif.

confertiflorum. GOLDEN YARROW. Per. to 2 ft.: lvs. divided into linear segms., to 1 in. long, tomentose on both sides: heads in terminal clusters, ¼ in. across. S. Calif.

lanatum. Per. to 1½ ft., white-woolly: lvs. deeply divided into 3–7 oblong or linear segms.: heads mostly solitary, rays deep yellow, ½ in. long. B. C. to Ida. and Calif.

pedunculatum. Per. to 1½ ft.: lvs. oblong-lanceolate, to 2 in. long, entire, tomentose on both sides. Idaho.

stæchadifolium. Subshrub to 3 ft.: lvs. linear, to 1¾ in. long, entire or rarely few-toothed, green above: heads in dense corymbs. Calif.

ERIOPSIS. *Orchidaceæ.* S. American epiphytes with strong pseudobulbs bearing 2–4 lanceolate lvs. and yellow or brownish fls. in racemes, the sepals and petals similar, the lip 3-lobed; for cult. see *Orchids.*

rutidobulbon. Pseudobulbs about 8 in. high, with 2 lvs.: fls. brownish-yellow, the lip white spotted with violet, about 1½ in. across, July–Aug. Colombia.

ERIOSTEMON. *Rutaceæ.* Evergreen shrubs, chiefly Australian: lvs. simple and entire, alternate, often bearing large glands: infl. axillary or terminal, the fls. white, pink, blue: fr. of 5 (or fewer) mostly distinct elastic carpels. Two species are listed in Calif.

myoporoides. Glabrous stout shrub, with glandular tubercles often very marked: lvs. narrow-obovate to narrow-lanceolate, to 4 in. long, mucronate: fls. white or pink, the petals about ⅓ in. long. Queensland to Victoria.

spicatus. Heath-like shrub to 2 ft., glabrous or nearly so: lvs. almost needle-like, ½ in. or less long: fls. blue or pink; petals about ¼ in. long. W. Australia.

ERITRICHIUM. *Boraginaceæ.* Small depressed mostly hispid per. herbs with alternate simple lvs. and small blue fls. borne in racemes or cymes; one species is sometimes planted in rock-gardens.

barbigerum: *Cryptantha barbigera.*

nanum. Densely white-woolly tufted plant, fl.-sts. to 3 in. high: lvs. elliptic: fls. small but sky-blue and brilliant, with yellow eye. Alps.

ERLANGEA. *Compositæ.* African herbs or shrubs allied to Vernonia and differing chiefly in technical characters of the achene and pappus; *E. tomentosa* is sometimes seen in the greenhouse.

cordifolia (*Gutenbergia cordifolia*). Erect pubescent herb: lvs. ovate, nearly sessile to clasping and somewhat cordate, serrulate, to 3 in. long: heads purple or lavender, about ⅓ in. diam. Trop. Afr.—Reported in Calif.

tomentosa (*Bothriocline Schimperi* var. *tomentosa*). Shrub to 5 ft.: lvs. oblong to ovate-lanceolate, to 5 in. long, toothed, white-tomentose beneath, scented: heads to ⅔ in. across, in flat-topped panicles, of mauve or lilac disk-fls. Trop. Afr.

ERODIUM. Heronsbill. *Geraniaceæ.* Herbs with lobed or pinnately dissected lvs., fls. in axillary umbels having 5 fertile stamens, 5-celled ovary and styles coiled at maturity; grown in the border or rock-garden and some sorts for forage. Some species have become weedy.

Erodiums thrive in dry sunny positions in loamy soil. Propagated by seeds and division. *E. cicutarium*, *E. moschatum* and *E. Botrys* are forage plants in California.

absinthoides (*E. olympicum*). Per. to 8 in.: lvs. bipinnate: fls. violet, rarely rose or white, ¾ in. across. Asia Minor. Var. **amanum** (*E. amanum*) has gray-pubescent foliage and white fls. Var. **Sibthorpianum** is smaller with short lvs.

amanum: *E. absinthoides* var.

Botrys. Ann., prostrate or sometimes erect, white-pubescent: basal lvs. lobed, st.-lvs. pinnatifid: fls. violet. Medit. region; nat. in W. U. S.

cheilanthifolium. Per. to 4 in.: lvs. all basal, bipinnate, gray-tomentose: fls. white veined with rose, to ¾ in. across. Mts. of S. Spain and Morocco.

chrysanthum. Tufted per. to 5 in., silvery: lvs. bipinnate, the st.-lvs. few: fls. yellow, ½ in. across. Greece.

ciconium. Ann. to 2 ft., hairy: lvs. bipinnate: fls. purplish-blue, large. S. Eu.

cicutarium. Alfilaria. Red-stem Filaree. Ann. to 1½ ft.: basal lvs. in rosettes, the lfts. pinnatifid: fls. purple or pink, about ¼ in. across. Medit. region; nat. in U. S.

corsicum. Per. to 6 in.: lvs. ovate, undivided or only slightly lobed: fls. pink veined with rose, ¾ in. across. Corsica, Sardinia.

daucoides. Per. to 4 in.: lvs. all basal, pinnate: fls. rose, ½ in. across. Spain.

gruinum. Ann. or bien. to 1½ ft.: lvs. somewhat lobed: fls. violet-blue. Sicily, N. Afr. to Persia.

Kolbianum. Hybrid between *E. supracanum* and *E. macradenum:* fls. pale rose with darker veins.

macradenum. Per. to 1 ft.: lvs. all basal, pinnate: fls. light purple with dark spots, about ½ in. across. Pyrenees.

Manescavi. Per. to 1½ ft.: lvs. all basal, pinnate: fls. rosy-purple, to 1½ in. across. Pyrenees.

moschatum. White-stem Filaree. Musk-Clover. Ann. or bien. to 1½ ft.: lvs. pinnate: fls. rose-purple. Eu.; nat. in U. S.

olympicum: *E. absinthoides.*

romanum. Per. to 8 in.: lvs. all basal, pinnate: fls. purplish, ½ in. across. Medit. region.

supracanum. Per. to 4 in.: lvs. all basal, bipinnate, silvery: fls. pink veined with rose, ½ in. across. Pyrenees.

trichomanefolium. Per. to 5 in.: lvs. all basal, bipinnate: fls. violet veined with rose, ⅓ in. across. Syria.

Willkommianum. Hybrid between *E. cheilanthifolium* and *E. macradenum.*

EROPHILA: see *Draba verna.*

ERPETION RENIFORME: *Viola hederacea.*

ERUCA. *Cruciferæ.* Ann. and bien. erect more or less Brassica-like herbs of few species in Eu. and W. Asia, one sometimes grown as a salad plant: lvs. large-toothed or pinnatifid: fls. whitish, yellow, purplish, in long terminal racemes: fr. an oblong to long-linear pod or silique.

sativa. Rocket-Salad. Roquette. Half-hardy ann., branching, to 2½ ft., with scattered hairs: fls. to 1 in. long, whitish or cream-yellow with purplish veins: pods 1 in. or more long, flat-beaked, erect and appressed. S. Eu.—Grown in the vegetable-garden for salad. The foliage is strong-tasting, and therefore it should be kept tender by continuous growth and frequent cutting; best results are obtained from lvs. in fit condition in spring and autumn, as in summer the plant runs quickly to seed. Seed is sown in open ground as soon as weather is settled, and lvs. fit for use should be had in two months or less.

ERVATAMIA. *Apocynaceæ.* Shrubs or small trees, one of which is much planted far S. for ornament, differing from Tabernæmontana in technical characters, native in Old World tropics.

coronaria (*Tabernæmontana coronaria*). Crape Jasmine. Clavel de la India. Large much branched glabrous shrub: lvs. oblong-lanceolate to elliptic, abruptly acuminate, entire, to 8 in. long: fls. waxy-white, very fragrant, to 2 in. across. Var. **flore-pleno**, with double fls., is the usual form. India; widely spread in trop. and warm countries.

ERVIL: *Vicia Ervilia.*

ERYNGIUM. Eryngo. *Umbelliferæ.* Mostly per. herbs with spiny-toothed lvs. which are simple and variously lobed or divided, small white or blue fls. in dense bracted heads or spikes, and ovoid frs. without ribs.

Planted in borders and rock-gardens. They thrive in sunny positions in light rich soil. Propagated by seed sown as soon as ripe, and by division.

alpinum. To 2 ft.: lower lvs. triangular-cordate, the upper round and often 3-lobed or palmately cut, tinged with blue: fls. blue or white, the heads 1¼ in. long, subtended by long finely divided bracts. Eu.

amethystinum. To 1½ ft.: lvs. obovate, 2-pinnate: fls. blue, the heads ½ in. long, subtended by long lanceolate bracts. Eu.—The plant grown under this name may be *E. planum.*

aquaticum (*E. yuccæfolium*). Button Snakeroot. Rattlesnake Master. To 6 ft.: lvs. long-linear, rigid, parallel-veined, the margins bristly: fls. white or pale blue, the heads about ¾ in. long, subtended by short bracts. E. U. S.

Bourgati. To 1½ ft.: lvs. nearly orbicular, palmately 3–5-parted and lobed, stiff, spiny-toothed: fls. blue, the heads ½ in. long, subtended by long spiny-tipped bracts. Medit. region.

cæruleum. To 3 ft.: lvs. ovate or oblong, heart-shaped at base, undivided or 3-lobed or -parted: fls. blue, the heads less than ½ in. long, subtended by very long stiff bracts. Orient.

cœlestinum: an unidentified trade name; possibly referable to *E. amethystinum.*

giganteum. To 6 ft.: lvs. ovate or triangular, heart-shaped at base, the st.-lvs. 3-lobed: fls. blue or pale green, the heads to 4 in. long, subtended by long, rigid, much-cut bracts. Caucasus.

Leavenworthii. To 3 ft.: lvs. oblanceolate or palmately parted, very spiny: fls. blue or white, the heads to 2 in. long, subtended by long spiny bracts. Kans. to Tex.

maritimum. SEA-HOLLY. To 1 ft., glaucous-blue: lvs. fleshy and stiff, broadly ovate, 3-lobed, with coarse spiny teeth: fls. pale blue, the heads to 1 in. long, subtended by bracts similar to lvs. but much smaller. Eu.

Oliverianum. To 3 ft.: lvs. broadly ovate, heart-shaped at base, the upper st.-lvs. palmately 4–5-parted: fls. blue, the heads 1½ in. long, subtended by stiff linear bracts. Hybrid of uncertain parentage.

planum. To 3 ft.: lvs. oval to oblong, heart-shaped, the st.-lvs. 3–5-lobed or -parted: fls. blue, the heads ½ in. long, subtended by narrow rigid bracts. Eu., Asia.

Serra. To 4 ft. or more: lvs. sword-shaped, spiny-toothed: fls. whitish, the globose heads ⅓ in. across, subtended by lanceolate bracts. Brazil.

Spinalba. To 16 in., whitish-green: lvs. leathery and stiff, broadly ovate, 4–5-parted, with coarse spiny teeth: fls. blue, the heads 2 in. long, subtended by stiff spiny-pointed pinnatifid bracts. Alps of Eu.

yuccæfolium: *E. aquaticum.*

Zabelii. Hybrid between *E. alpinum* and *E. Bourgatii:* to 1½ ft.: heads about 1 in. long.

ERYSIMUM. BLISTER-CRESS. *Cruciferæ.* Ann., bien. and per. herbs of many species mostly in temp. regions as the genus is traditionally defined, some of them flower-garden subjects related to wallflowers and stocks, mostly with yellow but sometimes lilac or blue fls. The group is closely related to Cheiranthus, differing only in technical characters.

The plants in cultivation are hardy and of simple requirements; perennials raised from seeds sown the year before bloom is wanted; annuals, seeds usually sown where plants are to stand, for summer bloom. They should have sunny exposure.

Allionii: see *E. asperum.*

arkansanum: *E. asperum, E. murale.*

asperum (*E. arkansanum. Cheirinia aspera*). Per., 1–3 ft., erect, pubescent: lvs. lanceolate or narrower, entire or lower ones remotely dentate, to 4 in. long: fls. orange to yellow: mature pods slender and spreading, 2–4 in. long. Widespread in N. Amer.—The cult. plant known as *Cheiranthus Allionii* apparently belongs here. Often erroneously grown as *E. Perofskianum.* See *E. murale.*

canescens. Bien., gray-canescent, to 3 ft., much branched: lvs. linear-lanceolate, entire: fls. yellow. E. Eu., Caucasus.

capitatum. COAST WALLFLOWER. Bien. to 1½ ft., erect and leafy, simple or branching, lightly pubescent: lvs. linear to narrow-oblong, entire or dentate, to 3 in. long: fls. cream-color, yellowish, or white. Calif. to Wash.

cuspidatum. Bien., rigid, simple or somewhat branched above, somewhat hairy: lvs. oblong, lower ones lyrate: fls. yellow. S. E. Eu., S. W. Asia.

helveticum: *E. ochroleucum.*

Kotschyanum. Per., cespitose, pale green, st. simple, to 5 in. or less: lvs. crowded, narrow-linear to awl-like, denticulate: fls. yellow-orange. High mts., Asia Minor.

linifolium (*Cheiranthus linifolius*). Per. making low clump 1 ft. or less high, grayish, much branched, shoots decumbent: lvs. linear, entire or toothed: fls. lilac or mauve. Spain.

murale. Bien., perhaps per., but may be grown as ann., dwarf and compact, 20 in. or less high, very leafy, the lvs. very little if at all toothed: fls. golden-yellow, in compact racemes that lengthen in fr.: pods erect, short and thick, 1½ in. or less long. Eu.—An old garden plant of indefinite botanical history; sometimes grown as *E. nanum, E. arkansanum nanum compactum* and *E. Perofskianum.* See *E. pulchellum.*

nanum: see *E. murale.*

ochroleucum (*E. helveticum*). Per. to 1 ft., with yellowish creeping sts.: lvs. oblong-lanceolate, toothed, pubescent: fls. pale yellow, fragrant. Eu.

pachycarpum. Per. to 2 ft., stout, with appressed hairs, branched, sts. angled: lvs. lanceolate, sinuate-dentate, stalked: fls. orange-yellow. Himalayas.

Perofskianum. Ann. to 2 ft., erect, simple or little branching, grayish-pubescent: lvs. lanceolate or narrower, entire or remotely toothed, to 3 in. long: fls. yellow or orange, showy. Beluchistan, Afghanistan.—A good flower-garden subject, but the per. plants sold under this name are likely to be *E. asperum* or *E. murale.*

pulchellum. Per., cespitose or many-headed, green, from a few inches to 2 ft. high, sts. simple: lvs. oblong-spatulate, toothed or lyrate, upper ones narrow and deeply toothed: fls. deep orange: pod erect-spreading, slender. Greece, Asia Minor.—The plant grown under this name may be *E. murale.*

pumilum. Per., 6 in., sts. simple and angled: lvs. mostly radical, lance-linear, entire, those on st. 3–5: fls. sulfur-yellow, slightly fragrant. Mts., Eu.

purpureum. Per. with procumbent woody sts., flowering sts. to 6 in.: lvs. narrow-linear, the lower pinnate, upper toothed or entire: fls. purple. Asia Minor.

repandum. Ann., somewhat appressed-hairy, to 1 ft. or more: lvs. lanceolate, entire or remotely toothed, to 2½ in.: fls. small, yellow. S. E. Eu. to India.

rupestre. Per., low, woody at base: lvs. spatulate or oblong, somewhat toothed, somewhat pubescent: fls. few, yellow. Greece.

suffrutescens. BEACH WALLFLOWER. To 2 ft., woody, much branched: fls. pale yellow or cream-colored. Calif., along coast.

ERYTHEA. *Palmaceæ.* Five species, as now recognized, of Mexican hermaphrodite fan-palms of mostly low or medium stature, unarmed except on petioles of some species, most of which are planted in S. Calif.: allied to Brahea (from which it was separated) but distinguished by technical characters of fls. and seeds, by the primary branches of the spadix attended by spathes, larger fls. and mostly much larger fr., and in most cases filaments in lf.-sinuses very few or none. For cult. see *Palm.*

armata (*Brahea* and *Glaucothea armata. B. glauca*). MEXICAN BLUE PALM. Stout robust palm to 40 ft. or more, the trunk naturally covered by a dense "petticoat" or shag as in Washingtonia: lvs. waxy-blue, in a heavy crown, deeply cut into about 50 segms.; petiole bearing strong curved white teeth or spines: spadix very long and extending much beyond lvs., bending over: fr. globose, about ¾ in. long, fleshy. Lower Calif.

Brandegeei. Tall, reaching 125 ft., and in nature generally shedding the old foliage: lvs. about 3 ft. long, dark green above and pale-glaucous underneath, cut to middle or somewhat beyond into segms. about 1 in. or less broad and cleft 1–4 in. deep at apex, the ends eventually hanging; petiole glabrous, 3–5 ft. long, with many marginal irregular spine-like teeth mostly less than ¼ in. long: fr. about ½ in. diam. Southern part of Lower Calif.—Two different palms appear to be planted in S. Calif. under this name.

edulis (*Brahea edulis*). GUADALUPE PALM. Trunk stout and columnar, to 30 ft., becoming naked, ringed with scars: lvs. 3 ft. long, green both sides but paler underneath; segms. 70 or 80, extending one-third to one-half depth of blade, 1½ in. or less broad, deeply cleft at apex, with few fibers in sinuses; petiole nearly or quite destitute of spine-teeth or else short and not very sharp: spadix not much if any exceeding petiole when in bloom: fr. globose, black, 1 in. more or less diam., hanging in an elongated cluster, the pulp sweet; seed about ¾ in. diam. Guadalupe Isl., Lower Calif.—Commonly planted in S. Calif.

elegans. Small tree as seen in cult.: lf.-blade glaucous on both surfaces; segms. extending about half way down, shortly bifid at apex; petiole armed: fr. pyriform or broadly obovoid, about ¾ in. long. Sonora, N. Mex.—Apparently there is some confusion in the planted material.

ERYTHRÆA: *Centaurium.*

ERYTHRINA. CORAL-TREE. *Leguminosæ.* Trees or shrubs or sometimes herbs, commonly thorny, with lvs. of 3 broad lfts., showy red or reddish or yellowish, nearly papilionaceous fls. in racemes, and elongated pods constricted between the seeds.

Grown for ornament in warm countries or the herbaceous kinds under glass; showy when in bloom, which usually precedes the foliage. Some species are planted for shade in coffee and cocoa plantations under the name "immortelles"; the flowers are cooked and eaten; the seeds are made into necklaces; some species also have medicinal and poisonous properties. Propagated by seeds and cuttings. The herbaceous kinds are propagated by root-division and the woody sorts from cuttings of growing wood.

arborea: *E. herbacea* var.

arborescens. Low tree, the branches prickly: lfts. to 1 ft. long and broad: fls. in short dense racemes: pods to 9 in. long, curved. Himalayas.

caffra. Tree to 60 ft., having small prickles: much like *E. Corallodendrum* but calyx 2-lipped or splitting. S. Afr.

Corallodendrum. Tree to 20 ft., prickly or unarmed: lfts. rhombic-ovate: fls. with standard never opening, scarlet, in loose racemes: pods to 4 in. long, the seeds scarlet and mostly with black spot. Trop. Amer.

Crista-galli. COCKSPUR C. Shrub or small tree, the petioles and often midribs spiny: lfts. ovate-oblong to oblong-lanceolate: fls. with standard erect, crimson, in loose racemes. Brazil.

flabelliformis. Shrub or small tree with spiny branches: lfts. usually broader than long: fls. in dense short racemes: pods to 1 ft. long. S. Ariz., New Mex., Mex.

fusca. To 8 ft., the bark brownish, prickly: lfts. lanceolate: fls. brownish-red, in terminal racemes, the calyx split. Cochin-China.

glauca. Tree to 60 ft., prickly at least when young: lfts. ovate, pale or glaucous beneath, leathery: fls. with orange standard and brown wings tipped with crimson, in racemes to 8 in. long: pods to 10 in. long. Trop. Amer.

herbacea. Sts. herbaceous, to 4 ft., the petioles usually prickly: lvs. triangular, often angled: fls. with standard closed, scarlet, in few-fld. racemes to 2 ft. long: pods to 5 in. long. N. C. to Fla. and Tex. Var. **arborea** (*E. arborea*) is a shrub or tree with mostly shorter racemes.

indica. Tall broad tree, unarmed or sometimes with small black prickles: lfts. broadly ovate: fls. deep red or scarlet, in dense racemes, the standard erect, the calyx splitting down the back, appearing mostly when tree is leafless: pods to 1 ft. long. India, Malaya. Var. **picta** (*E. picta*) has spotted or variegated lvs. and is grown under the names *E. Parcellii* and *E. marmorata.*

marmorata: *E. indica* var.

micropteryx: *E. Poeppigiana.*

pallida. Similar to *E. Corallodendrum* but with fls. pale or salmon-red. Trop. Amer.

Parcellii: *E. indica* var.

picta: *E. indica* var.

Poeppigiana (*E. micropteryx*). BUCARE. Tree to 60 ft., prickly: lfts. ovate: fls. with erect standard, cinnabar-red, in short racemes. Probably Peru.

velutina. Tree to 30 ft., spiny: lfts. roundish or triangular, tomentose beneath: fls. orange-red, the standard erect, calyx split: pods to 5 in. long. Trop. Amer.

ERYTHROCHÆTE PALMATIFIDA: *Ligularia japonica.*

ERYTHRONIUM. ADDERS-TONGUE. TROUT-LILY. *Liliaceæ.* Bulbous spring-blooming herbs with 2 basal lvs., which are often mottled, and attractive nodding fls. solitary or in racemes terminating the scape, the perianth-segms. distinct.

Planted in wild-gardens or rockeries. They prosper in shady or partially shady places in well-drained soil rich in leaf-mold; a winter mulch is beneficial. Propagated by seeds, or by offsets planted 3–5 inches deep.

albidum. To 1 ft., producing offsets: lvs. green or mottled: fls. white, pink or purplish, 1½ in. long, the segms. recurved. Ont. to Ga. and Tex.

americanum. To 1 ft., producing offsets: lvs. mottled with brown and whitish: fls. yellow, to 2 in. long, the segms. recurved. N. S. to Fla. and Ark.

californicum. FAWN-LILY. To 1 ft.: lvs. strongly mottled: fls. creamy-white, 1¼ in. long. Calif.

citrinum. To 8 in.: lvs. mottled: fls. lemon-yellow, 1¼ in. long, the segms. recurved. Ore., Calif.

dens-canis. DOGS-TOOTH VIOLET. To 6 in.: lvs. mottled with reddish-brown: fls. rose or purple, 1 in. long, the segms. recurved. Eu., Asia.

giganteum. To 1½ ft.: lvs. mottled: fls. creamy-white, to 2 in. long, the segms. strongly recurved. S. Ore.

grandiflorum. To 2 ft.: lvs. not mottled: fls. bright yellow, 2 in. long, the segms. strongly recurved. B. C. to Ore. and Utah. Var. **robustum** grows near the sea-level. Var. **album** has white fls. with yellowish center.

Hartwegi: *E. multiscapoideum.*

Hendersoni. To 1 ft.: lvs. mottled: fls. purple, 1¼ in. long, strongly recurved. S. Ore.

Howellii. To 1½ ft.: lvs. mottled: fls. pale yellow with orange center. S. Ore.

multiscapoideum (*E. Hartwegi*). To 6 in., producing offsets: lvs. mottled: fls. white or cream with yellow center. Calif.

obtusatum. Similar to *E. parviflorum* but with smaller bulb, obtuse lvs. and purple instead of yellow anthers. Wyo. to Mont.

parviflorum. To 1 ft.: lvs. not mottled: fls. bright yellow, about 1 in. long, the segms. strongly recurved. Colo. to Utah.

purpurascens. To 1 ft.: lvs. not mottled: fls. light yellow tinged with purple, ⅔ in. long. Calif.

revolutum. To 1 ft.: lvs. mottled: fls. white or lavender, turning purple. B. C. to Calif. Var. **Johnsonii** has lvs. mottled with dark brown and dark rose fls. In var. **præcox** the lvs. are mottled with mahogany color and fls. creamy-white. Var. **albiflorum** (var. *Watsonii*) has white fls. banded at base with maroon.

ERYTHROXYLACEÆ. COCA FAMILY. Two trop. genera of shrubs or small trees with alternate lvs., small regular fls. and fr. a 1- or 2-seeded drupe; only Erythroxylon is cult. In the sequence of families it is placed near Rutaceæ and Zygophyllaceæ.

ERYTHROXYLON. *Erythroxylaceæ.* About 90 species, with the characters of the family; the lvs. of *E. Coca* yield cocaine, for which the bush is cult. in S. Amer. and eastern tropics. Sometimes grown in the open in the far S. or in economic greenhouse collections N. Under glass propagated by cuttings over bottom heat.

Coca. COCA. COCAINE-PLANT. Shrub to 12 ft.: lvs. to 2½ in. long: fls. yellowish, ¼ in. across, not showy: drupe about ⅓ in. long, reddish, with furrowed stone. Nativity unknown, but probably W. S. Amer.

ESCALLONIA. *Saxifragaceæ.* Good ornamental shrubs of S. Amer., sometimes tree-like, mostly in the Andean region, evergreen, or some kinds deciduous (if so stated), well adapted to warmer parts of the country and a few of them north to Va. or farther: species 60 and more: lvs. alternate or clustered, simple, entire or serrate, often resinous-dotted and glandular: fls. more or less grossularia-like, fragrant, mostly in terminal racemes and panicles; fl.-parts mostly 5: fr. a many-seeded caps. The leading white-fld. kinds in cult. with us are *E. floribunda* and *E. montevidensis*, and others are *E. Grahamiana*, *E. illinita*, *E.*

leucantha, *E. pterocladon* (tinted), *E. pulverulenta*, *E. revoluta*, *E. virgata* with intermediate effects in *E. Rockii* and *E. rubricalyx;* the remainder are pink, rose, or shades of red.

The escallonias thrive under the usual conditions of parks and yards, being rapid and free growers. They are sometimes trained as vines and on pillars. They have become well known in California, where they are prized for general adaptability as well as for the habit of blooming in autumn and early winter although the flowering of several species is nearly continuous in proper climates. Propagation may be by seeds, but the usual method in mild climates is by means of cuttings in a coldframe in autumn and transplanting to nursery in spring.

alba: *E. montevidensis.*

Berteriana: *E. pulverulenta* var. *glabra.*

bifida: *E. montevidensis.*

edinensis. Hybrid of same or similar origin and character as *E. langleyensis.*

exoniensis (*E. pterocladon* × *E. rubra*). To 20 ft., with sparingly glandular angled or ribbed branchlets: lvs. somewhat elliptic, to 1½ in., pointed, serrate, essentially glabrous: fls. rose-tinted or nearly white, in terminal panicles to 2 or 3 in. long.

floribunda. Large bush or small tree, with somewhat viscid branchlets: lvs. oblong to narrowly obovate, to 4 in. long, mostly obtuse, long-tapering at base, entire or very finely serrulate, bright or glossy green above, sparingly dotted underneath: fls. white, ½ in. across, in long terminal rather narrow panicles, the petals long-clawed. Venezuela and down the Andean region. See *E. montevidensis.*

franciscana. Tall glandular and viscid shrub with erect branches and strong odor: lvs. thick, oblong, with short margined petiole, acute or obtuse at apex: fls. pink, in narrow viscid panicle. A garden form or hybrid, with the odor of slippery elm.

gracilis: the plant grown under this name appears to be *E. punctata.*

Grahamiana. Erect shrub with more or less spreading branchlets which bear sessile glands: lvs. stiffish, elliptic or oblong, to 2 in. or more long, obtuse but mucronate, narrowed to base, serrate, glossy above: fls. white, in terminal narrow or pyramidal panicles. Chile.

illinita. To 10 ft. or more, glabrous but young parts resinous and glandular, strong-scented: lvs. obovate or long-oval, to 2 in. or more long, obtuse or short-pointed, narrowed to base, glossy above, serrate: fls. white, in large bracted panicle. Chile.

Ingrami. Garden plant, perhaps hybrid between *E. macrantha* and *E. punctata*, the lvs. smaller than those of the former and fls. slightly smaller but similar in color (rose-red).

langleyensis. Hybrid, probably *E. Philippiana* × *E. punctata:* to 10 ft., somewhat glandular, with spreading arching branches: lvs. small, 1 in. or less long, oval or obovate, sessile or nearly so, serrate, resinous underneath: fls. rose-carmine, about ½ in. across, in short racemes on lateral twigs.

leucantha. Very leafy large shrub: lvs. small, obovate, nearly or quite obtuse, finely serrate toward apex, glabrous, ½ in. or less broad: fls. small, white, many in very dense racemes. Chile.

macrantha. Compact spreading shrub to 10 ft., densely leafy: lvs. thick, broad-oval, to 3 in. long and one-half or more as broad, shining on upper side and bearing many prominent glands underneath: fls. crimson or rose-red, to ½ in. or more long, in short close more or less leafy panicles. Chile.—Common where escallonias are grown and often passing under other names.

montana. Shrub to 6 ft.: lvs. obovate-oblong to lanceolate, to ¾ in. long, more or less serrate: fls. white, about a dozen in a dense terminal raceme; petals nearly ½ in. long. Chile.

montevidensis (*E. floribunda* var. *montevidensis. E. bifida. E. alba*). Much like *E. floribunda* but branchlets not viscid, lvs. mostly slightly emarginate at apex, fls. larger in a more rounded corymb-like cluster, the petals not narrowly clawed, stamens and pistils prominent. S. Brazil, Uruguay.—Variously understood, by some authors considered to be a geographical form of *E. floribunda*, but probably distinct.

organensis. To 6 ft., very leafy, branchlets angled, glabrous but somewhat resinous or glandular: lvs. narrowly obovate to oblong, often red-margined, firm, to 3 in. long, obtuse, dentate: fls. rose-red, to ½ in. across, in short dense broad terminal cluster close to the lvs. Organ Mts., Brazil.

Philippiana: *E. virgata* var.

pterocladon. To 10 ft. or more, pubescent, the branches thin-edged or winged: lvs. narrow-obovate, to 1 in. long (usually less), toothed, tapering to base, shining above: fls. white, in slender racemes to 3 in. long, the petals ⅓ in. long. Patagonia.

pulverulenta. Downy viscid shrub to 12 ft.: lvs. oblong, obtuse, tapering at base, to 4 in. long, fine-toothed, varnished above: fls. white, crowded in slender or tail-like raceme to 9 in. long. Chile. Var. **glabra** (*E. Berteriana*) is nearly or quite glabrous.

punctata (*E. rubra* var. *punctata*). Shrub to 10 ft., the young parts glandular-sticky and pubescent: lvs. oval or obovate, to 1 or 2 in. long, tapering both ends, toothed toward apex, strongly glandular underneath: fls. crimson, sometimes solitary but mostly in terminal corymbose glandular panicles, calyx glandular. Chile.

revoluta. To 25 ft. or more, white-pubescent: lvs. thick, obovate, to 2 in. long, apex obtuse or acutish, base tapering, toothed, margins revolute: fls. white, in dense terminal pyramidal panicles, the petals about ½ in. long. Chile.

Rockii (*E. macrantha* × *E. montevidensis*). Tall widely branched shrub: lvs. obovate, obtuse, tapering at base, to 2 in. long, glandular-serrate: fls. pale pink or white, in thyrse-like panicle to 12 in. or more long.

rosea: a name of doubtful standing in hort., applied to rose-colored forms of different species or hybrids.

rubra. Erect shrub to 15 ft., the young parts more or less glandular and viscid: lvs. oblanceolate to long-obovate, to 2 in. long, acute, tapering at base, serrate toward apex, nearly or quite glabrous and with few glands underneath: fls. red or crimson, about ⅓ in. across, in terminal panicles, the calyx typically not at all or very little glandular. Chile.

rubricalyx. Spreading shrub of medium size and rounded outline, with slender branches: fls. having white petals and red calyx, the petals forming a tube: lvs. like those of *E. Grahamiana*, and the plant perhaps a hybrid between that species and *E. rubra.*

sanguinea: hort. form of *E. macrantha.*

virgata. Deciduous shrub to 8 ft., with aspect of Leptospermum, branchlets glabrous and very leafy: lvs. obovate to lanceolate, acute, tapering at base, serrate toward apex, to ¾ in. long, glabrous: fls. white, to ½ in. across, in leafy terminal racemes. Chile. Var. **Philippiana** (*E. Philippiana*). Branches rugose: lvs. strongly acute, crowded-fasciculate in short very leafy branches. Chile.

viscosa. To 10 ft., with drooping sticky resinous branches: lvs. obovate, to 3 in. long, obtuse or with short abrupt point, tapering to short petiole, clammy, serrate: fls. white, in rather loose large panicles, corolla ⅓ in. or less across. Chile.

ESCHSCHOLZIA. *Papaveraceæ.* Herbs native in W. N. Amer. with much dissected lvs. and showy yellow solitary fls.; popular for the flower-garden. Many species that have been described are probably seasonal forms of *E. californica.*

Grown as annuals, the seeds sown where the plants are to stand in sunny exposure; in mild climates may be treated as winter annuals, and *E. californica* may live over winter after blooming.

aurantiaca: a hort. form of *E. californica.*

cæspitosa. To 9 in., the fl.-sts. exceeding the basal tufted lvs.: fls. yellow, to 2 in. across: fr. linear, to 3 in. long. Calif.

californica. CALIFORNIA-POPPY. To 2 ft., very variable: fls. pale yellow to orange, to 3 in. across: fr. linear, to 4 in. long. Calif., Ore.; nat. in Eu.

maritima. Sts. prostrate: fls. lemon-yellow with orange spot at base, ¾ in. long. Coast S. Calif.

tenuifolia. To 1 ft.: fls. light yellow, ½ in. long. Calif.

ESCOBARIA. *Cactaceæ.* Globose or cylindric and mostly cespitose cacti, juice not milky, several species in Mex. and S. Tex.: tubercles grooved above, spines never hooked: fls. small, from top of plant. See *Cacti.*

tuberculosa (*Mammillaria tuberculosa;* one of the plants known as *M. strobiliformis*). Body cylindric or becoming so, to 1 ft. or so high, usually in clumps, tubercles about ¼ in. long, radials numerous and white, centrals several and stouter: fls. light pink, 1 in. across. S. W. Tex., New Mex., N. Mex.

ESCONTRIA. *Cactaceæ.* One cactus of S. Mex., separated from Cereus, the ovary bearing papery persistent scales rather than essentially naked: fls. small, yellow, diurnal. Apparently not often planted. See *Cacti.* **E. Chiotilla** (*Cereus Chiotilla*). Tree-like, numerously branched, to 20 ft. and more, ribs few, radial spines 10–15, centrals several, all similar: fls. near ends of branches, about 1 in. long.

ESMERALDA: *Arachnis Clarkei.*

ESPARCET: *Onobrychis viciæfolia.*

ESPINO CAVAN: *Acacia Cavenia.*

ESTRAGON: *Artemisia Dracunculus.*

EUANTHE. *Orchidaceæ.* One Philippine orchid sometimes grown in the warm greenhouse. **E. Sanderiana** (*Vanda Sanderiana*). Sts. to 2 ft. high, thickly covered with lvs. to 1½ ft. long and 1½ in. wide: fls. 4 in. across, in 5–10-fld. racemes to 1 ft. long; dorsal sepal pale lilac, the lateral yellow marked with red-brown; petals shorter, light lilac; lip yellow, the lateral lobes forming a cup-like base, Oct.–Nov.

EUBOTRYS: *Leucothoë.*

EUCALYPTUS. Gum-Tree. *Myrtaceæ.* Evergreen trees, or sometimes shrubs, much grown in warm and semitrop. climates for the valuable timber and oil, for ornament and firewood, some of them for bee pasture, mostly native in Australia, having simple entire lvs. alternate or opposite on young shoots and often polymorphous, white, yellowish or red fls. in umbels or heads, the petals and calyx-lobes united to form a lid or cap which opens transversely and falls off, revealing the numerous showy stamens; there are 300 and more species, and the understanding of them is a special study.

Eucalypts are grown from seed. The capsules should be gathered and placed on canvas sheets in the sun till the seeds fall out. Seed should be sown in June or July in flats, either one seed in a place or broadcast and the seedlings then transplanted. Screens or lath-houses should be provided for shade. These seedlings will be ready to set permanently by about the following February, when from 6–10 inches high. On heavy soils the trees for forest plantations should be set 6 by 6 feet or if irrigation is employed 4 by 8 feet; on light soils 8 by 8 feet is best. The stands should be cultivated for at least the first two years.

Many species besides those entered in this article have been introduced into North America, largely in California, for forest purposes, specimen planting, and for test, represented by such names as *E. acmenioides, annulata, astringens, buprestium, cæsia, Caleyi, camphora, Consideneana, corrugata, crucis, decipiens, Drummondii, erythrocorys, Flocktoniæ, fœcunda, gracilis, grandis, Guilfoylei, gummifera, leptophylla* (equals *uncinata*), *Le-Souefii, macrandra, macrorhyncha, maculosa, Mortoniana, nutans, obtusifolia, oleosa, odorata, Preissiana, ptychocarpa, pyriformis, redunca, saligna, salmonophloia, Smithii, spathulata, Stowardi, Stricklandi, tetragona, Todtiana, torquata, uncinata.*

alba. Bark rough, ash-colored: lvs. ovate-oblong to broadly lanceolate, pale and glaucous: fls. small, in few-fld. umbels: fr. ¼ in. across.

albens: *E. hemiphloia* var.

alpina. Shrub to 12 ft.: lvs. ovate to oblong, very thick: fls. rather large, solitary or few together: fr. to 1 in. across.

amplifolia: a form of *E. tereticornis* having large round lvs. when young.

amygdalina. Peppermint Gum. To 300 ft., with persistent fibrous bark: lvs. lanceolate, with peppermint odor: fls. rather small, in many-fld. umbels: fr. ¼ in. across. Var. **angustifolia** (*E. linearis*) has very narrow lvs. and drooping branchlets. Var. **numerosa** has more than 20 fls. in an umbel. Var. **regnans** (*E. regnans*), to 325 ft., lvs. broad-lanceolate.

angustifolia: *E. amygdalina* var.

bicolor. Black Box. To 40 ft., with persistent rough bark: lvs. lanceolate: fls. small, in few-fld. umbels forming panicles: fr. about ⅙ in. across.

Blaxlandi. Similar to *E. capitellata* but with less stringy bark and young lvs. undulate with toothed margin.

Bosistoana. Bairnsdale Gray Box. Lvs. narrowly lanceolate: fls. in few-fld. umbels.

botryoides. Bastard Mahogany. Bangalay. To 150 ft., with persistent rough furrowed bark: lvs. lanceolate: fls. rather large, nearly sessile: fr. ⅓ in. across.

calophylla. Medium-sized tree, with rough corky deciduous bark: lvs. ovate-lanceolate, thick: fls. rather large, white or pink in var. **rosea**, in umbels forming a terminal panicle: fr. to 1½ in. across.

capitellata. Large tree, with furrowed fibrous bark: lvs. ovate-lanceolate, very thick and shining: fls. sessile, in umbels: fr. ⅓ in. across.

cinerea. Medium-sized tree, the bark whitish and persistent: lvs. ovate to ovate-lanceolate, glaucous or mealy-white: fls. in clusters: fr. ¼ in. across. Var. **multiflora** is listed.

citriodora: *E. maculata* var.

cladocalyx (*E. corynocalyx*). Sugar Gum. To 120 ft., with smooth deciduous bark: lvs. ovate-lanceolate to lanceolate: fls. ½ in. across, in 6–12-fld. umbels: fr. ¼ in. across.

coccifera. Small tree, the bark smooth and white: lvs. lanceolate, glaucous: fls. in clusters: fr. to ½ in. across.

cordata. To 50 ft.: lvs. orbicular to ovate, often crenate, usually glaucous or mealy-white: fls. rather small, nearly sessile: fr. ⅓ in. across.

coriacea. Tall tree, the bark deciduous, the inner bark smooth and whitish: lvs. ovate-lanceolate to lanceolate, very thick and shining: fls. in umbels: fr. ¼ in. across.

cornuta. Yate-Tree. Medium-sized tree: lvs. oblong or broadly lanceolate: fls. greenish-yellow, in dense heads, having a long horn-like lid: fr. ⅓ in. across.

corymbosa. Bloodwood. Medium-sized tree, with persistent rough bark: lvs. lanceolate: fls. yellowish-white, fragrant, in panicled umbels: fr. ½ in. across.

corynocalyx: *E. cladocalyx.*

cosmophylla. Shrub or small tree with smooth ash-colored bark: lvs. broadly lanceolate: fls. rather large, nearly sessile: fr. ⅔ in. across.

crebra. Narrow-leaved Ironbark. Bark deeply furrowed, persistent: lvs. lanceolate: fls. to ½ in. long, in panicles: fr. to ⅙ in. across.

diversicolor. Karri Gum. To 100 ft. and more, the bark smooth and white: lvs. lanceolate: fls. in umbels: fr. ⅓ in. across.

elæophora: *E. goniocalyx.*

eremophila. Shrub or small tree, with smooth scaly bark: lvs. narrow-lanceolate: fls. with reddish lid to 1 in. long.

erythronema. Small tree with rough reddish bark: lvs. lanceolate, thick and shining: fls. pink-red, in umbels: fr. to ½ in. across.

eugenioides. Resembling *E. piperita,* but with strongly fibrous bark, thicker not odorous lvs., and the rim of fr. flat or raised instead of depressed.

eximia. Mountain Bloodwood. Large tree, the bark brown or yellowish and scaly: lvs. falcate-lanceolate: fls. in panicles: fr. ⅓ in. across.

ficifolia. Scarlet-flowering Gum. To 30 ft. or more, the bark dark and furrowed: lvs. ovate to lanceolate, thick: fls. white to pink and scarlet, to 1½ in. long, in panicles: fr. to 1½ in. across.

gigantea: *E. obliqua.*

globulus. Blue Gum. To 300 ft., the bark deciduous, the trunk smooth grayish or bluish-white: lvs. lanceolate in mature trees, much broader and very glaucous on young ones: fls. 1½ in. across, solitary or few together: fr. to 1 in. across.—The commonest species in N. Amer. Var. **compacta** is a densely branched dwarf form.

gomphocephala. Tooart-Tree. To 120 ft., with persistent rough bark: lvs. lanceolate, thick and shining: fls. in umbels, sessile: fr. ½ in. across.

goniocalyx (*E. elæophora*). Bastard Box. Tall tree with rough deciduous bark: lvs. lanceolate, pale green: fls. in umbels: fr. ⅓ in. across.

Gunnii. Cider Gum. To 30 ft., with smooth whitish deciduous bark: lvs. ovate to lanceolate, thick and shining: fls. rather large, in umbels: fr. to ⅓ in. across.

hæmastoma. Large tree, the bark smooth and deciduous: lvs. falcate-lanceolate: fls. in umbels: fr. to ⅓ in. across. Var. **micrantha** (*E. micrantha*) has longer lvs. and smaller fls. and frs. Var. **capitata** is listed.

hemiphloia. To 90 ft., with rough persistent bark: lvs. lanceolate or broader, thick, often gray: fls. in panicles: fr. ¼ in. across. Var. **albens** (*E. albens*) has glaucous or white-mealy lvs. and larger frs.

Lehmanni. Small tree, the bark rough and deciduous: lvs. ovate to oblong: fls. in dense heads, the lid to 1½ in. long: fr. ½ in. across.

leucoxylon. White Ironbark. Tall tree with smooth pale deciduous bark: lvs. narrowly lanceolate, grayish-green: fls. 1 in. across, in umbels: fr. ½ in. across. Var. **purpurea** has bright purple fls. and var. **rosea** pink fls.

linearis: *E. amygdalina* var. *angustifolia.*

longifolia. Woollybutt. To 200 ft., with rough persistent bark: lvs. lanceolate: fls. rather large, in umbels: fr. ½ in. across.

Macarthuri. Bark rough and woolly: lvs. lanceolate: fls. in umbels: fr. to ¼ in. across.

macrorhyncha. Tall tree, the bark dark gray, fibrous and furrowed: lvs. lanceolate: fls. in umbels: fr. to ½ in. across.

maculata. Spotted Gum. To 150 ft., the bark deciduous in patches: lvs. lanceolate: fls. ½ in. long, in many-fld. panicles: fr. ½ in. across. Var. **citriodora** (*E. citriodora*), Lemon-scented Gum, has lvs. with strong odor of lemon.

Maideni. Tall tree, the bark smooth and whitish: lvs. narrow-lanceolate, chalky-white: fls. in umbels: fr. ¼ in. across.

marginata. Jarrah. Tall tree, the bark persistent or flaking: lvs. lanceolate: fls. in umbels: fr. ½ in. or more across.

megacarpa. To 100 ft., the grayish-white bark smooth and deciduous: fls. in umbels: fr. to 1 in. across.

melliodora. Honey-scented Gum. Yellow Box. To 150 ft., the roughish bark flaking off: lvs. narrowly lanceolate: fls. small, in umbels: fr. ¼ in. or less across.

micrantha: *E. hæmastoma* var.

Muelleriana. Yellow Stringybark. Medium-sized tree with stringy bark and yellow inner bark: lvs. lanceolate, glossy: fls. in umbels: fr. ½ in. across.

numerosa: *E. amygdalina* var.

obliqua (*E. gigantea*). To 300 ft., with persistent fibrous bark: lvs. ovate-lanceolate, very oblique, thick: fls. in umbels: fr. to ½ in .across.

occidentalis. Flat-topped Yate. Small tree, the bark usually smooth and deciduous: lvs. lanceolate: fls. in umbels, the lid to ¾ in. long: fr. ⅓ in. across.

ovata. Medium-sized to tall tree: lvs. lanceolate or very broad: fls. small, in axillary clusters, the lid sometimes beaked.

paniculata. Tall tree with hard deeply furrowed persistent bark: lvs. lanceolate: fls. in panicles or umbels: fr. ⅓ in. across.

pilularis. Blackbutt. To 150 ft., with blackish-gray persistent bark: lvs. lanceolate: fls. in umbels: fr. ⅓ in. across.

piperita. Peppermint Stringybark. Tall tree, with rough gray persistent bark: lvs. narrowly lanceolate, oblique, with peppermint odor: fls. in umbels: fr. ¼ in. across.

platyphylla. Bark deciduous, smooth and white: lvs. ovate: fls. in umbels, on short thick stalks: fr. ⅓ in. across.

platypus. Small tree with smooth grayish bark: lvs. oval, very thick and shining: fls. dull red or yellowish-white, in umbels with thick stalks: fr. ½ in. across.

polyanthemos. Red Box. Australian Beech. To 150 ft., the bark persistent: lvs. orbicular to ovate, grayish-green: fls. small, in many-fld. panicles: fr. ¼ in. across.

pulverulenta. Small tree: lvs. orbicular or ovate, glaucous or mealy-white: fls. in 1–3-fld. umbels: fr. ⅓ in. across.

punctata. Leather-Jacket. To 100 ft., the smooth dark bark deciduous in flakes: lvs. narrowly lanceolate: fls. in umbels: fr. ⅓ in. across.

rariflora. Tall tree, branches red: lvs. lanceolate to ovate: fls. in panicles or small umbels: fr. about ⅙ in. across.

regnans: *E. amygdalina* var.

resinifera. Red Mahogany. To 100 ft., with rough persistent bark: lvs. lanceolate, thick: fls. in umbels: fr. ⅓ in. across.

Risdoni. To 50 ft., the smooth bark deciduous in patches: lvs. ovate or lanceolate, on young shoots opposite and united at base, glaucous: fls. in umbels: fr. ⅓ in. across.

robusta. Swamp Mahogany. To 100 ft., with rough persistent bark: lvs. ovate-lanceolate: fls. ¾ in. across, in umbels: fr. ½ in. across.

rostrata. Red Gum. To 200 ft., with smooth gray deciduous bark: lvs. narrowly lanceolate: fls. to ½ in. across, in umbels: fr. ¼ in. across.

rubida. Resembling *E. viminalis* but with smooth white bark often having reddish patches.

rudis. Desert Gum. To 100 ft., with rough gray persistent bark: lvs. lanceolate: fls. ½ in. across, in umbels: fr. ½ in. across.

siderophloia. Broad-leaved Ironbark. To 100 ft., with deeply furrowed persistent bark: lvs. ovate-lanceolate to lanceolate: fls. in panicles: fr. ¼ in. across.

sideroxylon. Red Ironbark. Medium-sized tree with rough dark red or black persistent bark: lvs. narrowly-lanceolate, on young lvs. linear-lanceolate: fls. white or yellowish, in umbels: fr. ½ in. across. Var. **rosea** has rose-colored fls. Var. **pallens** has rose-colored fls. and silvery-gray foliage.

Sieberiana. Differs from *E. hæmastoma* chiefly in the dark furrowed bark.

Stuartiana. Apple-scented Gum. Tall tree with rough fibrous bark: lvs. ovate-lanceolate to lanceolate: fls. in umbels: fr. to ⅓ in. across.

tereticornis. Gray or Slaty Gum. To 150 ft., with smooth gray deciduous bark: lvs. broadly lanceolate: fls. ¾ in. across, in umbels: fr. ¼ in. across.

tetraptera. Small tree with sharply 4-angled branches: lvs. oblong-lanceolate, very thick: fls. very large, sessile and solitary: fr. 1 in. across.

urnigera. Bark smooth, pale brown, branchlets drooping: lvs. ovate to lanceolate, glaucous: fls. in 3-fld. umbels: fr. ⅓ in. across.

viminalis. Manna Gum. To 300 ft., the branches pendulous: lvs. lanceolate: fls. ½ in. across, in umbels: fr. ¼ in. across.

virgata. Shrub or small tree: lvs. lanceolate, shining: fls. in umbels: fr. to ½ in. across.

EUCHARIDIUM. *Onagraceæ.* Californian ann. herbs with alternate lvs., showy fls. having 3-lobed petals borne in terminal racemes or spikes, and linear capsular frs. Cult. as for *Clarkia;* flower-garden subjects for sunny positions.

Breweri (*Clarkia Breweri*). Fairy Fans. To 9 in.: lvs. lanceolate: fls. deep pink; petals fan-shaped with a narrow central long lobe.

concinnum (*E. grandiflorum. Clarkia concinna* and *grandiflora*). Red Ribbons. To 2 ft.: lvs. ovate-oblong to oblong: fls. rose-purple; petals with 3 nearly equal lobes.

grandiflorum: *E. concinnum.*

EUCHARIS. *Amaryllidaceæ.* Bulbous herbs from Colombia, with broad basal lvs. narrowed into petioles, and large beautiful chaste-white fls. in umbels terminating the scape, the perianth with cylindrical tube and spreading segms.

The Amazon-lily is grown out-of-doors in warm countries or in a greenhouse with the night temperature at about 65°. It succeeds in coarse fibrous soil and should be liberally watered except in the resting period. Protection from the sun should be given except in the winter months. Propagated by offsets in spring.

amazonica: *E. grandiflora.*

grandiflora (*E. amazonica*). Amazon-Lily. Lvs. about 1 ft. long and 6 in. broad, the petiole 1 ft. long: fls. fragrant, to 3 in. across, on scapes 2 ft. high. Andes of Colombia.

EUCHLÆNA. Teosinte. *Gramineæ.* Broad-leaved grasses resembling maize and grown for forage in the S.: monœcious; staminate spikelets in terminal panicles; pistillate in axillary spikes inclosed in a husk from which the long styles protrude; grain or seed large; native in Mex. and Cent. Amer.

luxurians: *E. mexicana.*

mexicana (*E. luxurians*). Ann. to 10 ft. or more, very leafy: lvs. to several ft. long and 1–2 in. wide, midrib prominent: grain shining, ¼ in. long. Mex.

perennis. Differs from *E. mexicana* in being per. and propagating by rhizomes. Mex.

EUCOMIS. *Liliaceæ.* S. African bulbous herbs with basal lvs. in rosettes and greenish or whitish fls. in racemes terminating the scape and tipped with a crest of leafy bracts, the perianth-segms. distinct. Of easy cult. in warm climates or in greenhouses in the N. Propagated by offsets.

punctata. Pineapple-Flower. To 2 ft.: lvs. to 2 ft. long and 3 in. across, spotted with brown beneath: fls. green, ½ in. long.

EUCOMMIA, the only genus of *Eucommiaceæ,* which stands near Hamamelidaceæ and Rosaceæ. One deciduous tree from Cent. China, yielding rubber although difficult of extraction. **E. ulmoides.** To 60 ft.: lvs. alternate, elliptic to oblong-ovate, to 3 in. long, toothed, elm-like as the specific name implies: fls. unisexual, in Apr. before or with the lvs., without perianth, the anthers red: fr. a winged nutlet to 1½ in. long.—Hardy N. Propagated by seeds and cuttings of young wood under glass.

EUCRYPHIA, the only genus in *Eucryphiaceæ.* A few species in Australia and Chile, by some authors formerly included in Rosaceæ and also in Saxifragaceæ and Hypericaceæ: evergreen shrubs or trees, sometimes partially deciduous, planted for ornament, intro. particularly in Calif.: lvs. opposite, simple or pinnate, bearing large white somewhat rose-like fls. in the axils: petals 4, large; stamens numerous and conspicuous: fr. a dehiscent caps.

Billardieri. Large glabrous tree, sometimes grown as a shrub: lvs. simple, oblong, obtuse, entire, whitish underneath: fls. to 2 in. across. Tasmania.

cordifolia. Small tree or large shrub: lvs. simple, cordate and oblong, pubescent, crenate: fls. large. Chile.

glutinosa (*E. pinnatifolia*). Tree to 20 ft.: lvs. pinnate, the 3–5 lfts. elliptic to lance-ovate, to 2 in. long: fls. 2 in. or more across. Chile.

pinnatifolia: *E. glutinosa.*

EUGENIA (incl., for our purpose, *Jambosa, Myrciaria, Syzygium*). *Myrtaceæ.* Trop. and semi-trop. evergreen bushes and trees in many parts of the world and of very many species, in the western hemisphere native as far north as S. Fla.: lvs. opposite, simple, mostly firm and glossy: fls. commonly white, cream-colored or purple, solitary, racemose or paniculate, the stamens numerous and conspicuous: fr. a drupe-like yellow, red, purple or black berry, sometimes edible.

Eugenias are grown in Florida, California and similar climates for the ornamental habit, foliage, flowers and berries, and some kinds for the eatable fruits. They are of simple requirements, propagating by means of seeds, and by cuttings on a bench or in a frame. In California, *E. paniculata* and its variety are much planted, and in Florida also; the young growths are red-brown and showy, the winter color often brilliant; there is a form with variegated leaves.

apiculata (*Myrtus Luma*). To 4 ft. or more: lvs. oval, to 1 in long: fls. white, ½ in. across, in 3's: fr. black. Chile.

aromatica (*Caryophyllus aromaticus*). Clove-Tree. Tree to 30 ft.: lvs. ovate-oblong, to 5 in. long: fls. pale purple, ¼ in. across, in terminal cymes, the dried fl.-buds comprising the cloves of commerce. Moluccas.

australis: *E. paniculata* var.

brasiliensis: *E. Dombeyi.*

cauliflora (*Myrciaria cauliflora*). Jaboticaba. Tree to 40 ft., upward-branching from near the ground and bearing clusters of fls. and fr. along the trunk and branches: lvs. lanceolate or somewhat broader, acuminate, to 4 in. long: fls. small, white: fr. globular, to 1 or 1½ in. diam., purple. S. Brazil, prized for the edible fr.—Has been tried in Fla. and S. Calif. Two or three related species are apparently known as jaboticabas.

Cumini (*E.* and *Syzygium Jambolana*). Jambolan-Plum. Tree to 80 ft.: lvs. oblong to oval, to 8 in. long, acuminate and sometimes emarginate on same tree with others: fls. white, about ⅓ in. across, in branching cymes: fr. purplish-red, to 2 in. diam., edible. E. Indies, Burma.

Curranii. Tree to 50 ft.: lvs. oblong-elliptic, to 12 in. long: fls. in panicles often from tubercles on st.: fr. size of grape, edible. Philippine Isls.

cyanocarpa. Glabrous tree with lanceolate willow-like lvs. to 3 in. long and tapering both ways from middle, strongly cross-veined, petiole very short: fls. to ¾ in. across, in terminal clusters: fr. blue. Australia.

Dombeyi (*E. brasiliensis* of planters). Grumixameira-Tree. Tree to 50 ft.: lvs. oval to somewhat obovate, coriaceous, to 5 in. long: fls. solitary, white: fr. dark red becoming black, edible. Brazil.

eucalyptoides. Small tree or shrub: lvs. lanceolate, to 6 in. or more long, pointed: fls. in compact terminal cymes, the orbicular petals about ¼ in. across: fr. globular. Australia.

floribunda (*Myrciaria floribunda*). Tree to 30 ft., glabrous: lvs. lanceolate to ovate-lanceolate, to about 3 in. long, long-acuminate: fls. white, sessile in lateral clusters: fr. red or yellow, to ⅓ in. diam. W. Indies.

Hookeri, Hookeriana: *E. paniculata.*

Jambos (*Jambos vulgaris* and *J. Jambos. Caryophyllus Jambos*). Rose-Apple. Jambos. Broad tree to 30 ft.: lvs. long-lanceolate, tapering both ends, to 8 in. long: fls. greenish-white, to 3 in. across, the stamens very conspicuous, terminal and few together: fr. to 2 in. diam., greenish or yellow, employed in making preserves and confectionary. Trop. Asia; nat. elsewhere.

malaccensis (*Jambosa malaccensis*). Malay-Apple. Pomerack. Tree to 30 ft. or more high, with thick heavy top: lvs. oblong to somewhat obovate, thick, to 12 in. long: fls. red-purple, 2 in. across, borne along branches, stamens much exceeding petals and covering the ground as they fall: fr. red, 2 in. long. India, Malaya.

Mato. Tree to 20 ft.: lvs. ovate to oblong-lanceolate, obtuse: fls. white, solitary in the axils, on stalks to ¾ in. long. Argentina.

Michelii: *E. uniflora.*

microphylla: see *E. myriophylla.*

monticola. Shrub or tree to 30 ft.: lvs. ovate to lanceolate, to 1½ in. long, pale beneath: fls. small, in axillary clusters: fr. black at maturity, very small. W. Indies.

myriophylla (*Myrciaria myriophylla*). Much branched bush: lvs. very narrow and crowded (at least on juvenile plants), to 1½ in. or more long, 1/16 in. or less broad, entire, punctate, midrib obscure above but prominent underneath: fls. white, solitary on axillary peduncles. S. Cent. Brazil.—Grown in pots in its vegetative stage for decoration under the mistaken name *E. microphylla.*

myrtifolia: *E. paniculata* var. *australis.*

operculata (*Syzygium operculatum*). Tree to 50 ft.: lvs. elliptic to broadly ovate, to 8 in. long: fls. small, white, 3 together: fr. purplish-black, edible. Himal.

paniculata (*E. Hookeri* and *Hookeriana*, Hort.). Small vigorous tree, mostly not continuous-blooming: lvs. oblong-lanceolate, to 3 in. or more long, prominently acuminate, tapering at base: fls. white or whitish with conspicuous stamens, about ½ in. across, in small clusters terminal and on the ends of short branchlets or long peduncles and therefore showing beyond the foliage: fr. rose-purple, to about ¾ in diam., employed in jelly-making. Australia. Var. **australis** (*E. australis. E. myrtifolia*). Remaining more bushy and usually blooming more or less throughout the year: lvs. on young shoots oblong-acuminate but on flowering shoots prevailingly short-elliptic and obtuse or short-acute and about 2½ in. long or less: fls. not prominent beyond the foliage: fr. usually smaller.—There are different opinions as to the botanical name this species should bear.

Pitanga. Low shrub, young parts pubescent: lvs. elliptic-oblong or narrow-lanceolate, to 3 in. long: fls. solitary or in one form fascicled: fr. red, nerved, about ½ in. diam. Brazil, Argentina.

pungens. To 40 ft.: lvs. elliptic-oblong, to 3 in. long, spine-tipped: fls. solitary, the peduncles shorter than lvs.: fr. white-tomentose or puberulent, small. Brazil.

Smithii. Tall tree: lvs. ovate to ovate-lanceolate, to 3 in. long: fls. white, small, in terminal panicles: fr. white or purplish. Australia.

supraaxillaris. Tree to 25 ft.: lvs. oval-oblong, to 5 in. long, shining, pale beneath: fls. in about 9-fld. racemes to ¾ in. long, supraaxillary. Brazil.

Ugni: *Myrtus Ugni.*

uniflora (*E. Michelii*). Pitanga, Surinam-Cherry. Shrub or tree to 25 ft.: lvs. ovate to ovate-lanceolate, to 2 in. long: fls. white, fragrant, ½ in. across, solitary or few together: fr. deep crimson at maturity, 8-ribbed, edible. Brazil.

EULALIA: *Miscanthus.*

EULOBUS: see *Œnothera californica.*

EUONYMUS. Spindle-Tree. *Celastraceæ.* Shrubs or small trees, sometimes root-climbers or creepers, mostly of the north temp. zone, sometimes evergreen, with opposite simple lvs., small greenish or purplish bisexual fls. in axillary cymes, and capsular fr. having the seeds inclosed in an aril.

Whether the name of this genus shall be spelled Evonymus or Euonymus is a question of varying practice. Botanical nomenclature begins with Linnæus, Species Plantarum, 1753, with which it is agreed to associate the generic descriptions of his Genera Plantarum, fifth edition, 1754. In the former work Linnæus spelled the name Evonymus, having taken it over from Tournefort, and in the latter Euonymus as if it were at that time a preference. In those days less importance was attached to such variables. There are good arguments for either spelling and neither one can be said to be "correct" as against the other, but it is preferred here to adopt Euonymus.

Many species and varieties are grown for ornament. Most of the species are hardy in the northern states. Ordinary soil and position are satisfactory. Propagated by seeds stratified and sown in spring, hardwood cuttings, the evergreen species under glass, and layers. Grafting is sometimes practiced with varieties and weak kinds, using strong kinds for stock.

alatus. Deciduous shrub to 8 ft., the branches with corky wings: lvs. elliptic, finely toothed: fr. purplish. China, Japan. In var. **aptera** (*subtriflora*) the branches are not winged.

americanus. Strawberry-Bush. Deciduous shrub to 8 ft.: lvs. ovate- to oblong-lanceolate, wavy-toothed: fr. pink. N. Y. to Fla. and Tex.

arborescens: listed name.

atropurpureus. Wahoo. Burning-Bush. Deciduous shrub or tree to 25 ft.: lvs. elliptic, finely-toothed: fls. purple: fr. scarlet. Ont. to Fla. and Mont.

britzensis: listed name, probably a form of *E. radicans.*

Bungeanus. Deciduous shrub to 15 ft.: lvs. elliptic-ovate or -lanceolate, finely toothed: fr. yellowish. China, Manchuria. Var. **semipersistens** is half-evergreen.

europæus. Deciduous shrub or tree to 25 ft.: lvs. ovate to oblong-lanceolate, finely toothed: fr. pink. Eu. Var. **alba** (var. *leucocarpa*) has whitish fr. Var. **nanus** is a dwarf form.

fimbriatus: *E. pendulus.*

Hamiltonianus. Small tree: lvs. lanceolate-oblong, finely toothed: fr. pink. Himalayas.

japonicus. Evergreen shrub to 15 ft.: lvs. oval, obscurely toothed, shining above: fr. pink. Japan; planted in southern states. There are many forms, a few of which are: **albo-marginatus,** lvs. with narrow white border; **argenteo-variegatus,** lvs. edged and marked with white; **aureus** has yellow lvs. when young; **aureo-marginatus,** lvs. edged with yellow; **aureo-variegatus,** lvs. blotched with yellow; **medio-pictus,** lvs. with yellow blotch in center; **microphyllus** (*E. pulchellus*) has small lvs.; **pallens,** young lvs. pale yellow; **pyramidatus** (var. *columnaris*) is of columnar habit; **viridi-variegatus** or "Duc d'Anjou" has bright green lvs. variegated with yellow and green.

kewensis: *E. radicans* var. *minimus.*

lanceifolius. Deciduous shrub or tree to 30 ft.: lvs. lanceolate, wavy-toothed: fr. pale. China.

latifolius. Deciduous shrub or tree to 20 ft.: lvs. oval to oblong, finely toothed; fr. rosy-red. Eu., W. Asia.

Maackii. Shrub or small tree: lvs. oblong, finely toothed: fr. pink. China, Manchuria, Korea.

nanus (*E. rosmarinifolius*). Deciduous shrub to 3 ft., sometimes procumbent: lvs. linear, usually entire, the margins revolute: fr. pink. Asia.

obovatus (*E. americanus* var. *obovatus*). Running Strawberry-Bush. Deciduous procumbent shrub to 1 ft., the branches rooting: lvs. obovate, finely toothed: fr. pink. Ont. to Ky.

oxyphyllus. Deciduous shrub or small tree: lvs. ovate to ovate-oblong, finely toothed: fr. dark red. Japan.

patens. Partially evergreen shrub to 10 ft.: lvs. oval to obovate, wavy-toothed: fr. pink. China.

pendulus (*E. fimbriatus*). Small evergreen tree, branches drooping: lvs. oblong-lanceolate, finely sharp-toothed: fr. 4-winged. Himalayas.

planipes. Deciduous shrub or small tree: lvs. obovate, finely toothed: fr. 5-angled. Japan.

pulchellus: *E. japonicus* var. *microphyllus.*

radicans. Evergreen shrub, trailing or climbing by rootlets: lvs. oval, wavy-toothed: fr. greenish-white or pinkish. Japan. Var. **acutus** is a climbing form with acute lvs. Var. **argenteo-marginatus** has lvs. margined with white. Var. **Carrierei** is a low spreading shrub. Var. **coloratus,** lvs. bright red in autumn. Var. **foliis-variegatus** has lvs. with a broad white margin. Var. **minimus** (*E. kewensis*) has very small lvs. ½ in. or less long. Var. **pictus** (var. *argenteo-variegatus*), veins of lvs. marked with white. Var. **reticulatus** has lvs.

marked with white along the veins. Var. **vegetus** is a bushy form to 5 ft. and more; common.—This species and its forms are popular for covering brick walls and foundations.

rosmarinifolius: *E. nanus.*

Sieboldianus. Lvs. elliptic: fr. 4-ribbed. Japan.—The plant usually cult. under this name is *E. patens.*

verrucosus. Shrub to 6 ft.: lvs. ovate, crenate-toothed: fr. yellowish-red, deeply 4-lobed. S. Eu., W. Asia.

Wilsonii. Shrub climbing to 20 ft.: lvs. lanceolate, to 5 in. or more long, serrate: fls. many, yellowish, in cymes: fr. 4-lobed, with yellow aril. China.

yedoensis. Deciduous shrub to 10 ft.: lvs. obovate, minutely toothed: fr. pink. Japan.

EUPATORIUM. THOROUGHWORT. BONESET. *Compositæ.* Mostly herbaceous perennials with opposite lvs. and heads in clusters or panicles, of purple, rose and white disk-fls. blooming in late summer and autumn; pappus of hair-like bristles; mostly native in Mex., W. Indies and trop. S. Amer.

Many tropical bonesets are very satisfactory in the greenhouse and others in the hardy border or wild-garden. Those grown under glass are given the same care as the florists stevia (Piqueria), being propagated usually by cuttings in winter or early spring. The hardy herbaceous types require the treatment of the average perennial and are increased by division or by seeds. The species most likely to be seen under glass are *E. glabratum, glandulosum, glechonophyllum, ligustrinum, riparium, sordidum (ianthinum).*

adenanthum: *E. glandulosum.*

adenophorum: *E. glandulosum.*

ageratoides: *E. urticæfolium.*

album. To 3 ft., rough-hairy: lvs. oblong, to 4 in. long, coarsely toothed: heads white. L. I. to Fla. and La.—Suited to poor soil.

altissimum. To 8 ft., grayish-pubescent: lvs. lanceolate, to 5 in. long, toothed or entire: heads white or pinkish. Pa. to N. C. and Tex.

americanum: *E. glandulosum.*

araliæfolium. Shrub: lvs. oblong, to 8 in. long, entire, leathery and glabrous: heads white. Mex. to Guatemala.

aromaticum. To 2 ft., slightly pubescent: lvs. ovate, to 3 in. long, coarsely toothed: heads white. Mass. to Fla. and Miss.

atrorubens. To 2½ ft., with red or purple hairs: lvs. ovate, to 1 ft. long, toothed: heads red or purple. Mex.

cannabinum. HEMP AGRIMONY. To 6 ft., pubescent: lvs. 3–5-parted into lanceolate coarsely toothed segms.: heads pale purple. Eu.

cinereum. Shrubby: lvs. ovate-lanceolate, 3 in. long, toothed, white-tomentose beneath: pappus white. Trinidad.

cœlestinum (*Conoclinium cœlestinum*). MIST-FLOWER. To 3 ft., pubescent: lvs. triangular-ovate, to 3 in. long, coarsely toothed: heads light blue to violet. N. J. to Fla. and Tex.

conspicuum (*E. grandifolium*). Herb or shrub to 6 ft.: lvs. triangular-ovate, to 5 in. long, toothed: heads white. Mex., Guatemala.

elegans: *E. glabratum.*

Fraseri: *E. urticæfolium.*

glabratum (*E. elegans. E. latifolium*). Shrub to 8 ft., sticky and nearly glabrous: lvs. ovate to oblong, to 2½ in. long, fine-toothed or entire, pale beneath: heads pale pink. Mex.

glandulosum (*E. adenanthum. E. adenophorum. E. americanum*). Often decumbent, glandular-pubescent: lvs. ovate, coarsely toothed: heads pure white, ageratum-like. Mex.—Sometimes grown erroneously as *E. glutinosum.*

glechonophyllum (*Ageratum conspicuum*). Low branching subshrub, nearly glabrous: lvs. triangular-ovate, about 1 in. long, bluntly few-toothed: heads white. Chile.

glutinosum: see *E. glandulosum.*

grandiflorum: probably *E. atrorubens.*

grandifolium: *E. conspicuum.*

ianthinum: *E. sordidum.*

incarnatum. To 4 ft., pubescent: lvs. triangular-ovate, to 2 in. long, toothed: heads pink or pale purple. Va. to Fla. and Mex.

Lasseauxii (*Ageratum* and *Conoclinium Lasseauxii*). To 2 ft., glandular-hairy: lvs. alternate, oblong-lanceolate, bluntly toothed: heads white changing to rose. Temp. S. Amer.

latifolium: *E. glabratum.*

ligustrinum (*E. micranthum. E. Weinmannianum*). Shrub to 15 ft.: lvs. oblong, to 3½ in. long, few-toothed, glandular below: heads white, often with deep rose pappus. Mex. to Cent. Amer.

macrophyllum: listed name of doubtful identity.

maculatum. JOE-PYE WEED. To 6 ft., rough-pubescent, st. often spotted purple, not glaucous: lvs. ovate or ovate-lanceolate, often whorled, thick, coarsely toothed: heads pink or purple, in flat-topped infl., the florets 9–15. Newf. to B. C. south to Ill. and N. Mex.—Probably most of the stock planted as *E. purpureum* belongs here.

micranthum: *E. ligustrinum.*

odoratum (*Osmia odorata*). Shrubby, to 2 ft. or partially climbing, pubescent: lvs. ovate or ovate-lanceolate, to 6 in. long, toothed: heads white to blue. Fla., W. Indies, S. Amer.

perfoliatum. COMMON B. To 5 ft., pubescent: lvs. lanceolate, to 8 in. long, the pairs united at base around the st., rugose, fine-toothed: heads grayish-white varying to bluish-purple. N. S. to Fla. and Tex.

purpureum. JOE-PYE WEED. To 10 ft., sts. mostly not speckled, glaucous: lvs. mostly in whorls, oval to lanceolate, to 1 ft. long, tapering at base, coarsely toothed: heads pink or purple, rarely whitish, in open convex infl., the florets 5–7. Me. to Fla., Okla. and Tex.—See *E. maculatum* and *E. verticillatum.*

riparium. Woody at base, 2 ft., sts. pubescent, reddish: lvs lanceolate, to 4 in. long, toothed: heads white. Mex.

serotinum. To 8 ft., pubescent, much branched: lvs. ovate-lanceolate, to 6 in. long, coarsely toothed: heads white. Del. to Fla. and Tex.

serrulatum. Shrub: lvs. lanceolate, to 2½ in. long, finely toothed, slightly glandular-pubescent: heads white. Brazil.

sessilifolium. To 6 ft., nearly glabrous: lvs. lanceolate or ovate-lanceolate, to 6 in. long, sharp-toothed, sessile: heads white. Vt. to Ga. and Ala.

sordidum (*E. ianthinum*). Shrub, the sts. densely reddish-tomentose: lvs. ovate to ovate-oblong, to 4 in. long, toothed: heads violet, fragrant. Mex.

Torreyanum. To 3 ft.: lvs. lanceolate, to 3 in. long, slightly toothed, sessile: heads white. Pa. to Fla. and Tex.

urticæfolium (*E. ageratoides. E. Fraseri*). WHITE SNAKEROOT. To 4 ft., glabrous or hairy: lvs. ovate, to 6 in. long, coarsely toothed: heads white. N. B. to Fla. and La.

vernale. Shrub, pubescent: lvs. oblong-ovate, to 5 in. long, toothed, grayish-tomentose beneath: heads white. Mex.

verticillatum. JOE-PYE WEED. To 8 ft. or more, st. speckled purple: lvs. ovate to narrow-ovate, mostly in 3's and 4's, to 8 in. long, broadly contracted at base: fls. purple in convex or rounded panicles. Coastal plain, Mass. to S. C.—See *E. purpureum.*

Weinmannianum: *E. ligustrinum.*

EUPHORBIA. SPURGE. *Euphorbiaceæ.* Herbs or shrubs or small more or less succulent trees of many classes and kinds (sometimes ranged in several genera), often cactus-like, with milky juice, simple lvs., fls. in cyathia (see *Euphorbiaceæ*), and fr. a 3-parted caps. The species are native in various parts of the world.

The succulent or cactus-like forms are grown in the greenhouse, and for hedges and specimen plants in the South; for cult. see *Succulents.*

The hardy herbaceous species are suitable for the border or rock-garden and thrive in any good garden soil. Seeds may be sown where the plants are to stand and then thinned to about 10 inches.

Poinsettias (*E. pulcherrima*) are propagated by cuttings, usually taken in early summer from young growth of stock that has been kept over winter. These cuttings afford bloom about Christmas time. They should be kept in pots in a temperature of about 65°. Where grown in the open poinsettias may be propagated from April on by canes about 3 feet long stuck in the ground. Other shrubby euphorbias are similarly handled.

canariensis. Shrub or tree to 20 ft., with thick 4–6-angled branches and small black spines, a few foliage lvs. Canary Isls.

Chamæsyce. Prostrate ann. with short thread-like sts.: lvs. roundish: fls. solitary, having whitish appendages. Medit. region.

cœrulescens. Succulent shrub with thick 4–5-angled jointed bluish-glaucous branches, spines to ½ in. long, and triangular scale-like lvs. S. Afr.

corollata (*Tithymalopsis corollata*). FLOWERING S. Per. to 3 ft.: lvs. oblong to linear: fls. in umbels, with white petal-like appendages. Ont. to Fla. and Tex.

Cyparissias (*Tithymalus Cyparissias*). CYPRESS S. Per. to 1 ft.: lvs. linear: fls. in many-rayed umbels, the bracts yellowish. Eu.; nat. in E. U. S., on banks and in cemeteries.—A good ground-cover.

epithymoides (*E. polychroma*). Per. to 1 ft., forming attractive clumps: lvs. oblong, the floral ones often yellow: fls. in umbels. E. Eu.—Showy in the border.

fulgens (*E. jacquinæflora*). SCARLET PLUME. Shrub to 4 ft.: lvs. lanceolate: fls. in cymes, with scarlet petal-like appendages. Mex.—Grown under glass N.

globosa. To 3 in., the fleshy joints globose or club-shaped and about 1 in. diam.: lvs. very small, deciduous: involucre with green white-pitted lobes. S. Afr.

havanensis: *E. lactea.*

heterophylla (*Poinsettia heterophylla*). MEXICAN FIRE-PLANT. Ann. to 3 ft.: lvs. variable, ovate to linear, entire, toothed or fiddle-shaped, the upper lvs. blotched with red and white: fls. in terminal clusters. Ill. to Fla., trop. Amer.—An acceptable flower-garden subject.

Intisy. Shrub with fleshy, globose forked branches, gray-green and with numerous white dots: lvs. small, borne on protuberances. Madagascar.—Intro. in U. S. for test as a rubber-producing plant.

jacquinæflora: *E. fulgens.*

lactea (*E. havanensis*). Cactus-like shrub or tree of candelabra form, the branches 3–4-angled with a marbled white band down the center, bearing short thick spines and no foliage lvs. E. Indies.—Planted only in warm countries or under glass.

Lathyrus (*Tithymalus Lathyrus*). CAPER S. MOLE-PLANT. Ann. to 3 ft.: lvs. lanceolate, the floral ones ovate: fls. in umbels. Eu.; nat. in N. Amer.

marginata (*E. variegata. Lepadenia marginata*). SNOW-ON-THE-MOUNTAIN. Ann. to 2 ft.: lvs. ovate to oblong, the upper ones with white margins: fls. in umbels, with white petal-like appendages, Minn. to Tex.—Popular as a flower-garden subject.

Myrsinites. Fleshy bien. or per., prostrate or decumbent at base, then ascending or erect: lvs. obovate, in spirals, sessile: fls. yellow, in umbels. Eu.

neriifolia. Succulent tree or shrub, with 5-angled sts. and short spines: lvs. thick, obovate-oblong, to 5 in. long: fls. in cymes. E. Indies.

ornithopus. Succulent and spineless little plant, branching near ground into cylindric tuberculate branches to 4 in. long, with long-jointed and short-jointed forms: lvs. rudimentary and soon falling: peduncles 1½–3 in. long, bearing cup-shaped green involucres. S. Afr.

pilosa. Per. to 1½ ft.: lvs. oblong: fls. in umbels. Eu., N. Asia. Var. **major** has golden-yellow foliage.

polychroma: *E. epithymoides.*

pteroneura. Low shrub with jointed angled branches ⅓ in. thick, the lvs. soon falling. Mex.—Grown under glass N.

pulcherrima (*Poinsettia pulcherrima*). POINSETTIA. Shrub to 10 ft. or more: lvs. ovate to lanceolate, entire or lobed, the upper ones narrower and bright red (white, var. **alba**, or pink, var **rosea**) and constituting the showy part of the plant: fls. in cymes. Trop. Amer., Cent. Mex. Var. **plenissima** has fls. transformed into red bracts.

rhipsalioides. Differs from *E. Tirucalli* in having ovate lanceolate lvs. about ¾ in. long. Trop. Afr.

similis. Tree to 30 ft., spiny, with 4–5-angled fleshy branches, the joints to 1½ ft. long: lvs. scale-like or sometimes to 3½ in. long, deciduous. S. Afr.

splendens. CROWN-OF-THORNS. Woody, the climbing sts. to 4 ft. long and armed with spines to 1 in. long: lvs. obovate, soon falling: fls. in cymes, the bracts bright red. Madagascar.—Grown under glass.

stricta (*Tithymalus stricta*). Ann. to 2 ft.: lvs. ovoid to lanceolate: fls. in umbels. Eu.

Tirucalli. MILK-BUSH. INDIAN TREE S. Shrub or tree to 30 ft., with a crown of slender irregular branches, leafless as the narrow lvs. soon fall: fls. in small clusters. Afr.—Grown in the open in S. Fla., under glass in the N.

tridentata. Succulent and spineless little plant; branches from the base to 6 in. long, cylindrical or tapering, with angled tubercles: lvs. ¼ in. or less long, soon falling: peduncles 3–4 at ends of branches, bearing 1 involucre and a pair of bracts. S. Afr.

variegata: *E. marginata.*

EUPHORBIACEÆ. SPURGE FAMILY. A large and important assemblage of herbs, shrubs and trees, sometimes cactus-like, often with milky juice, of about 250 widely distributed genera. The fls. are of various forms, sometimes in cyathia, i.e., an apetalous pistillate fl. is surrounded by several staminate fls. which consist of a single stamen jointed on the pedicel and all inclosed by a corolla-like involucre which often has petal-like appendages; ovary superior and commonly 3-celled: fr. usually a caps. This family includes many plants of economic importance, yielding rubber, edible roots and fruits, and having valuable medicinal and poisonous properties; there are also many ornamental subjects. In some cases, as poinsettia, the showy parts are colored bracts. Those genera cult. with us are Acalypha, Aleurites, Antidesma, Bischofia, Breynia, Codiæum, Dalechampia, Daphniphyllum, Euphorbia, Hemicyclia, Hevea, Homalanthus, Hura, Jatropha, Mallotus, Manihot, Mercurialis, Pedilanthus, Phyllanthus, Ricinus, Sapium, Synadenium, Xylophylla.

EUPHORIA. *Sapindaceæ.* Trop. Asian trees with alternate pinnate lvs., small regular fls. in panicles, and fr. covered with flattened tubercles; grown for the edible fr.

Longans withstand slight frost and also should be protected from the sun in summer; they thrive in protected places in southern Florida and southern California. Propagated by seed, layers and grafting.

Longana (*Nephelium Longana*). LONGAN, LUNGAN. To 40 ft.: lvs. of 2–5 pairs of glossy elliptic to lanceolate lfts. to 1 ft. long: fls. yellowish-white, in terminal panicles: fr. yellow-brown, 1 in. across, with white juicy edible flesh. India.

EUPLOCA. *Boraginaceæ.* Small ann. hispid herbs with alternate entire pubescent lvs. and white salver-shaped solitary fls., the corolla narrowed at orifice; one or two N. American plants sometimes united with Heliotropium.

convolvulacea (*Heliotropium convolvulaceum*). To 1 ft.: lvs. lanceolate or ovate, to 1½ in. long: fls. ½ in. long, fragrant. Wash. to Calif. and New Mex.

EUPTELEA. *Trochodendraceæ.* Asian deciduous shrubs or trees with alternate toothed lvs., fls. in clusters before the lvs., without sepals and petals but with long red anthers, and fr. a samara.

These plants do best in loamy well-drained soil in rather moist positions. Propagated by seeds or by grafting on their own roots. The following stand in southern New England.

Franchetii. To 75 ft.: lvs. roundish-ovate, to 5 in. long, regularly toothed: frs. 1–3-seeded. Cent. China.

polyandra. Differs from above in the lvs. being coarsely and unequally toothed, and the frs. usually 1-seeded. Japan.

EUROTIA. *Chenopodiaceæ.* Small white-tomentose shrubs of Eu. and N. Amer., one rarely planted: lvs. alternate, entire: fls. unisexual, in small clusters borne in spikes.

lanata. WINTER FAT. To 2 ft.: lvs. linear, to 1¼ in. long, revolute: pistillate fls. with tufts of silvery-white hairs. Sask. to Calif. and New Mex.

EURYA. *Theaceæ* (*Ternstrœmiaceæ*). Evergreen shrubs or trees with alternate simple lvs., mostly diœcious fls. in axillary clusters, and berry-like frs.; suitable for greenhouse cult. or in the open in the S. For cult. see *Camellia.*

japonica (*E. latifolia*). Lvs. toothed: fls. small, greenish-white. E. Asia. Var. **variegata** has lvs. variegated with white.

latifolia: *E. japonica.*

ochnacea (*Cleyera japonica*). Lvs. entire: fls. creamy-white, fragrant: berries red. Himalayas to Japan. The lvs. are variegated in var. **variegata.**

EURYALE. *Nymphæaceæ.* One species, very prickly and spiny, somewhat similar to *Victoria regia* but the fls. much smaller and all stamens fertile. **E. ferox.** Lvs. 1–4 ft. across, circular, purple and spiny-ribbed beneath, dark green and uneven above: fls. green outside, bright red inside, about 2 in. across, open by day, prickly outside: fr. many-seeded globular berry, seeds edible. India, China.—Treated as an ann.; propagated by seeds only, planted in rich earth as for nympheas, temperature 70–75° F. Hardy as far north as Philadelphia and St. Louis.

EUSCAPHIS. *Staphyleaceæ.* One deciduous shrub to 10 ft., native in Japan and China and not fully hardy in the N. Propagated by seeds and cuttings of green wood under glass. **E. japonica** (*E. staphyleoides*). Lvs. pinnate, of 7–11 ovate-lanceolate toothed lfts. to 3 in. long: fls. yellowish-green, in terminal panicles to 5 in. across: fr. of 3 reddish leathery pods ½ in. long.

EUSTOMA. *Gentianaceæ.* A few N. American glaucous herbs with opposite lvs. and white or blue bell-shaped fls. in panicles or solitary, with keeled calyx, 5- or 6-lobed corolla, and many-seeded capsular fr.; sometimes grown in the flower-garden.

Russellianum. PRAIRIE GENTIAN. Ann. erect herb to 3 ft.: lvs. ovate to oblong, to 3 in. long: fls. pale purple, about 2 in. across and 2 in. long, erect or flaring. Neb. to Tex.—Showy plant but not often seen in cult.; sometimes treated as bien., the well established seedlings being carried over winter in a frame.

EUSTREPHUS. *Liliaceæ.* Australian vine-like plants woody at base, having alternate lvs. and fls. clustered in axils of upper lvs., the perianth- segms. distinct and fringed. Of easy cult. under glass or in the open in warm climates. Propagated by division or seeds.

latifolius. Lvs. linear-lanceolate, to 4 in. long: fls. white or light blue, ¼ in. long: fr. an orange-colored berry about ½ in. across.

EUTAXIA. *Leguminosæ.* Australian nearly or quite glabrous shrubs, one intro. in Calif.: lvs. small and opposite: fls. yellow, papilionaceous, mostly axillary and solitary or few together. **E. empetrifolia** (*E. diffusa*) is a heath-like bush with lvs. about ¼ in. or less long: fls. ¼ in. or less long, each one with a pair of leaf-like bracts at base: pod to ¼ in. long.

EUTERPE. *Palmaceæ.* Feather-palms of trop. Amer., perhaps 10 species, unarmed, monœcious, with branched spadices below the lvs.: trunk solitary or plant gregarious: fls. white, sessile, in 3's and the middle one pistillate or one of them often abortive; stamens 6, distinct: fr. globose, small, with thin outer flesh or a shell. The name Euterpe is variously interpreted. The species are adapted to greenhouse cult., and should stand in parts of S. Fla. See *Palm.*

edulis. ASSAI PALM. MANICOLE. Clustered palm to 60 ft. and more, with ringed trunks and graceful drooping pinnæ and arching lvs. green on both sides but lighter underneath; pinnæ numerous, singly placed, 15–24 in. long, 1½ in. or less broad, secondary veins strong, all except the uppermost narrowed into long thin points: fr. about ½ in. diam., purple-black. Brazil, Guiana, in forests.

globosa (*Acrista monticola*). Trunk single, to 50 ft., coarsely ringed with lf.-scars: lvs. 5–7 ft. long, much lighter underneath; pinnæ many, 1½–3 ft., long and 2 in. or less broad, the points not prominently thin, secondary veins strong: fr. shining black, about ½ in. thick. Cuba to Grenada.

EUTHAMIA: *Solidago.*

EUTOCA: *Phacelia.*

EVEA: *Cephaelis.*

EVERGREENS: see *Conifers.*

EVERLASTING. IMMORTELLE. Plants used for "dry bouquets" for winter decoration, comprising various kinds that retain their form and color when dried; usually the flowers have chaffy or papery parts. Most of the common everlastings are members of the Compositæ, as Ammobium, Anaphalis, Antennaria, Helipterum, Helichrysum, Xeranthemum. One common kind, Gomphrena, is an amaranth. Statice, of the Plumbaginaceæ, is much used. Cut before the flowers are fully expanded, with long stems, and hang in an airy shady place to cure. Various dry fruits are used with everlastings, as Physalis, Lunaria. Many of the grasses are also employed for dry bouquets, as well as teasels, cat-tails and many other plants from the wild. All the foregoing plants are of simple culture.

EVODIA. *Rutaceæ.* Trees or shrubs, often somewhat Rhus-like, native in E. Asia, Australia and Polynesia, with opposite simple or compound aromatic lvs., small unisexual fls. in cymes or panicles, and fr. of 4–5 carpels.

Some species (as those here described) are hardy in the North and others are greenhouse subjects. Propagated by seeds, cuttings of half-ripened wood, and root-cuttings.

Daniellii. Small tree: lvs. of 7–11 lfts.: fls. white, in terminal corymbs to 6 in. across. N. China, Korea.

Henryi. Tree to 35 ft.: lvs. of 5–9 lfts.: fls. whitish, in panicles to 2½ in. across. Cent. China.

hupehensis. Similar to *E. Henryi* but lvs. light green beneath and fls. smaller in panicles to 6 in. across. Cent. China.

EVOLVULUS. *Convolvulaceæ.* Prostrate or erect herbs or sometimes shrubs, having small alternate lvs. and small blue, rose or white axillary fls. 5-angled or -lobed; native in warm regions.

bocasanus. Herb to 2 ft.: lvs. lanceolate, to 2 in. long, sessile: fls. bright blue with white center, ½ in. across. Trinidad, Venezuela.

EVONYMUS: *Euonymus.*

EXACUM. *Gentianaceæ.* Old World herbs with opposite, simple and entire lvs. and blue or white wide-open fls. solitary or in forking cymes; corolla 4- or 5-lobed: fr. a 2-valved caps. Grown under glass or out-of-doors in warm regions. Propagated by seed.

affine. Bien. to 2 ft.: lvs. to 1½ in. long, ovate: fls. bluish. ½ in. across. Socotra.

macranthum. Bien. to 2 ft.: lvs. to 3 in. long, oblong: fls. purplish-blue, ringed with yellow in throat, 2 in. across. Ceylon.

zeylanicum. Ann. to 2 ft.: lvs. 3 in. long, oval-oblong: fls. blue, 1½ in. across. Ceylon.—Differs from *E. macranthum* in the lobes of corolla obtuse rather than pointed.

EXOCHORDA. PEARL-BUSH. *Rosaceæ.* Asian spirea-like deciduous shrubs with alternate lvs., white fls. in terminal racemes in spring, and fr. a 5-angled caps. with winged seeds.

Pearl-bushes are very ornamental and hardy North, prospering in sunny positions in well-drained soil. Propagated by seeds, by layers, and by cuttings of soft wood.

Alberti: *E. Korolkowi.*

Giraldii. To 15 ft.: lvs. elliptic, to 2½ in. long, petioles to 1 in. long, often red: fls. 1½ in. across; stamens 20–30. China. Var. **Wilsonii** has fls. to 2 in. across and green petioles.

grandiflora; *E. racemosa.*

Korolkowi (*E. Alberti*). To 12 ft.: lvs. oblong, to 3 in. long, petioles ½ in. long: fls. 1½ in. across; stamens 25. Turkestan.

macrantha. Hybrid between *E. racemosa* and *E. Korolkowi.*

racemosa (*E. grandiflora*). To 10 ft.: lvs. elliptic to oblong-obovate, to 2½ in. long, petioles to ½ in. long: fls. to 2 in. across; stamens 15. China.

EXSERTED: sticking out; projecting beyond, as stamens from a perianth; not included.

EYE: the marked center of a flower; a bud on a tuber, as on a potato; a single-bud cutting.

F

FABIANA. *Solanaceæ.* Small heath-like shrubs grown in greenhouses and in the open in mild climates for the numerous small white tubular fls.: lvs. very small, narrow and crowded: native in S. Amer., one grown in S. Calif. where it blooms at different seasons. Easily increased by cuttings taken in Aug.

imbricata. To 8 ft., much branched: lvs. very numerous, scale-like, overlapping: fls. borne singly but in great numbers on the ends of the short branches, ½ in. long, constricted at base. Peru.

FABRICIA: *Leptospermum.*

FAGACEÆ. Beech Family. Six widely distributed genera of woody monœcious plants, with alternate simple lvs., staminate fls. in catkins or heads, pistillate solitary or clustered, 4–7-lobed perianth, 4–20 stamens, inferior 3–7-celled ovary, and fr. a nut inclosed in a cup or bur. The family furnishes valuable timber, edible nuts, medicinal and dyeing products, cork, and numerous ornamental subjects. Genera cult. are Castanea, Castanopsis, Fagus, Lithocarpus, Nothofagus, Quercus. Most of the planted subjects are hardy in the central or northern U. S., but some of them only far S., and comprise some of the most desirable lawn and shade and grove hardwood trees.

FAGARA: see *Zanthoxylum.*

FAGELIA: *Calceolaria.*

FAGOPYRUM. *Polygonaceæ.* European and Asian herbs with alternate lvs., small white fls. in racemes or corymbs, and fr. a pointed triangular achene.

Plants are grown for the seeds from which flour is made and as a cover- or catch-crop in orchards; the following are tender annuals of quick growth. Of easy cultivation on a wide range of soils. Seeds are sown broadcast or in drills late in June or early in July in the northern states.

esculentum. Buckwheat. To 3 ft.: lvs. triangular-ovate, to 3 in. long: fls. white, fragrant, in short dense racemes or clusters mostly near summit of plant. Cent. or N. Asia.

tataricum. India-Wheat. Kangra Buckwheat. To 2 ft.: lvs. broadly arrow-shaped, to 2 in. long: fls. greenish or yellowish, in slender open racemes along the st. India.—It has been known as duckwheat.

FAGUS. Beech. *Fagaceæ.* Tall deciduous monœcious trees with smooth light gray bark, alternate toothed lvs., staminate fls. in drooping heads, and 1 or 2 brown 3-angled nuts inclosed in a prickly involucre; native of the north temp. zone.

Beeches are excellent and emphatic ornamental trees, furnish valuable timber, and the nuts are eaten. They prosper on loam limestone soil. Propagated readily by seeds sown in fall or stratified and kept until spring; protect from vermin. Seedlings should be transplanted to prevent the formation of long taproots. Varieties are grafted on seedling stock under glass.

americana: *F. grandifolia.*

ferruginea: *F. grandifolia.*

grandifolia (*F. americana. F. ferruginea*). American B. Large and characteristic tree: lvs. ovate-oblong, to 5 in. long, dark bluish-green above, turning yellow in autumn. N. B. to Fla. and Tex.—Variable in lf. characters. Differs from the frequently planted European beech in longer coarsely serrate lvs. with more veins (9–14 pairs).

Sieboldii. Japanese B. Lvs. ovate, to 4 in. long: involucre with bract-like appendages at base. Japan.

sylvatica. European B. Lvs. ovate, to 4 in. long, denticulate, shining dark green above, turning reddish-brown in autumn. Eu. to Caucasus. Some of the hort. vars. are: **albo-variegata**, lvs. variegated with white; **asplenifolia**, lvs. very narrow, deeply toothed or lobed; **atropunicea** (var. *atropurpurea*, var. *purpurea*, var. *Riversii*), Purple B., lvs. purple; **borneyensis**, intermediate between vars. *pendula* and *tortuosa;* **fastigiata** (var. *pyramidalis*), of columnar habit; **grandidentata**, lvs. coarsely toothed; **laciniata** (var. *incisa*, var. *heterophylla*), Fernleaf or Cutleaf B., lvs. deeply toothed or lobed or sometimes nearly entire and linear; **latifolia**, lvs. to 6 in. long and 4 in. wide; **luteo-variegata**, lvs. variegated with yellow; **miltoniensis**, drooping form; **pendula**, Weeping B., branches drooping; **purpureo-pendula**, branches drooping, lvs. purple; **roseo-marginata**, lvs. purple edged with pale pink; **rotundifolia**, lvs. nearly orbicular, 1 in. or less long; **tortuosa** (var. *remillyensis*), branches twisted, drooping at tips; **tricolor**, lvs. nearly white, spotted with green and edged with pink; **variegata**, lvs. variegated with white or yellow.

FAIRY BELLS: *Disporum.*

FAIRY FANS: *Eucharidium Breweri.*

FAIRYWAND: *Chamælirium luteum.*

FAME-FLOWER: *Talinum.*

FAMILY. An assemblage of genera that rather closely or uniformly resemble each other in general appearance and technical characters. A few genera are so unlike all others that a family is constituted for them alone, as in the case of Eucryphia, Eucommia, Cercidiphyllum, Casuarina, Punica, Equisetum. Other families are vast associations of genera that are more like each other than they are similar to others, as the great Compositæ or Composite family that comprises well toward 1,000. Opinions differ as to the natural or practicable limits of families as they do also in respect to genera and species; thus the Composite family may be divided into two or more, as the maple genus may be divided into Acer and Negundo. Nature sets no formal limits. More than 300 families of seed-bearing or flowering plants are commonly recognized. The attentive gardener and botanist soon learns to recognize the important natural families and thereby to place a given plant in its proper relationship: this is the beginning of the mastery of the subject. In this book all the families that are represented by genera in the text are placed with the other entries in alphabetic order; the lists of genera under them suggest the family kinships and constitute the best ready definition.

FANWORT: *Cabomba.*

FAREWELL-TO-SPRING: *Godetia amœna.*

FARFUGIUM: *Ligularia.*

FARKLEBERRY: *Vaccinium arboreum.*

FASCIATED: much flattened; an abnormal or teratological widening and flattening of the stem.

FASCICLE: a condensed or close cluster, as of flowers.

FATSIA. *Araliaceæ.* One evergreen shrub or small tree native in Japan, grown under glass in the N. and out-of-doors in mild regions for its prominent foliage. Propagated by seeds, cuttings, and root-cuttings in spring. **F. japonica** (*Aralia japonica. A. Sieboldii*). To 20 ft.: lvs. to 16 in. across, glossy above, palmately cut beyond the middle into 5–9 toothed lobes: fls. whitish, in umbels 1 in. or more across in long panicles. Var. **Moseri** is a compact-growing form. Var. **variegatum** has lvs. marked or bordered with golden-yellow. For *F. papyrifera* see *Tetrapanax papyriferum.*

FAUCARIA. *Aizoaceæ.* Separated from Mesembryanthemum (which see for cult.): plant at first stemless but becoming more or less short-stemmed, the lvs. half-cylindric in cross-section and keeled or 3-angled at end, the fls. large and nearly or quite sessile and bractless; stigmas 5 or 6. **F. tigrina** (*M. tigrinum*). Lvs. ovate-cordate and glaucous-green, spotted or dotted white, very fleshy, to 1½ in. long, ciliate: fls. solitary, yellow; styles 5. S. Afr.

FEATHER-FLEECE: *Stenanthium robustum.*

FEDIA. *Valerianaceæ.* One ann. herb native in the Medit. region and occasionally grown in the flower-garden or as a salad plant. **F. Cornucopiæ** (*F. scorpioides*). AFRICAN VALERIAN. Sts. to 1½ ft. long, often purplish: lvs. ovate-spatulate, to 4 in. long, entire or toothed: fls. red, small, in terminal cymes, stamens 2: fr. about ⅛ in. long.

FEIJOA. *Myrtaceæ.* Two S. American shrubs or trees with opposite simple lvs., solitary fls. with long-exserted stamens, and fr. a berry; one is grown for the edible fr. and as an ornamental. This plant was first named *Orthostemon Sellowianus* by Berg but subsequently changed by him to *Feijoa* because of an earlier *Orthostemon.*

Feijoas are adapted to subtropical dry climates but will withstand several degrees of frost. The best soil is sandy loam rich in humus. Plants should be spaced 15 to 18 feet apart. Propagated by seeds sown in pans or flats, a good soil being silver-sand and well-rotted redwood sawdust; the seedlings should be shaded and transplanted permanently when about 4 inches high. Also increased by layering, whip-grafting, and cuttings of young wood from ends of branches under glass.

Coolidgei: pomological variety of *F. Sellowiana.*

Sellowiana. To 18 ft.: lvs. oval-oblong, to 3 in. long, white-tomentose beneath: fls. to 1½ in. across, the petals fleshy, white-tomentose outside and purplish within, the stamens dark red, handsome: fr. green tinged with red, to 3 in. long. S. Brazil, Paraguay, Uruguay, Argentina.—Successful as a fruit plant in Calif.; stands in N. Fla.

FELICIA. *Compositæ.* African herbs or subshrubs grown in the greenhouse and in the open in warm regions for the attractive daisy-like fls. with blue or white rays and yellow disks: lvs. alternate or opposite, entire or dentate: pappus of bristles. Propagated by seeds and by cuttings.

amelloides (*Agathæa cœlestis*). BLUE DAISY. BLUE MARGUERITE. Subshrub to 3 ft., somewhat hairy: lvs. opposite, oval or obovate, about 1 in. long, entire or nearly so: heads solitary, to 1¼ in. across, rays numerous, sky-blue, on long stalks. S. Afr.

fragilis: *F. tenella.*

petiolata. Subshrub with prostrate branches: lvs. obovate or lanceolate: heads rose changing to blue. S. Afr.—Grown in hanging-baskets.

tenella (*F. fragilis*). Ann. or bien, to 14 in., often prostrate: lvs. narrow-linear, to 2 in. long: heads solitary, rays pale blue. S. Afr.

FEMININE: pistillate (in higher plants); the seed-bearing parent or flower when the sexes are separate.

FENESTRARIA. *Aizoaceæ.* One of the many segregates from the old genus Mesembryanthemum (which see) from S. W. Afr., characterized by a tufted stemless habit with fleshy upwardly thickened lvs. that bear a small more or less colorless or translucid area or "window" at the apex, the lvs. of each pair about equal: fls. large and showy; stigmas 10 or 11. **F. rhopalophylla** (*M. rhopalophyllum*) has white fls. to 1¾ in. diam., the petals about 35 in a single series to ¾ in. long; stigmas filiform, pale yellowish-green.

FENNEL: *Fœniculum vulgare.* **Common Giant:** *Ferula communis.*

FENNEL-FLOWER: *Nigella.*

FENUGREEK: *Trigonella Fœnum-Græcum.*

FENZLIA: *Linanthus dianthiflorus.*

FERDINANDA. *Podachænium eminens.*

FERN: see *Ferns.* **Adders-tongue-:** *Ophioglossum.* **Asparagus-:** *Asparagus plumosus.* **Ball-:** *Davallia bullata.* **Bamboo-:** *Coniogramme japonica.* **Basket-:** *Nephrolepis pectinaza.* **Bears-foot-:** *Humata Tyermannii.* **Beech-:** *Dryopteris Phegopteris.* **Birds-nest-:** *Asplenium Nidus.* **Bladder-:** *Cystopteris.* **Boston-:** *Nephrolepis exaltata* var *bostoniensis.* **Brittle-:** *Cystopteris fragilis.* **Chain-:** *Woodwardia.* **Christmas-:** *Polystichum acrostichoides.* **Cinnamon-:** *Osmunda cinnamomea.* **Claw-:** *Onychium.* **Climbing-:** *Lygodium.* **Cup-:** *Dennstaedtia.* **Curly-grass-:** *Schizæa pusilla.* **Dagger-:** *Polystichum acrostichoides.* **Deer-:** *Blechnum spicant.* **Elephant-ear-:** *Elaphoglossum crinitum.* **Felt-:** *Cyclophorus.* **Floating-:** *Ceratopteris.* **Gold-:** *Pityrogramma.* **Goldie-:** *Dryopteris Goldiana.* **Grape-:** *Botrychium.* **Hacksaw-:** *Doodia aspera.* **Hares-foot-:** *Polypodium aureum.* **Hartford-:** *Lygodium palmatum.* **Harts-tongue-:** *Phyllitis Scolopendrium.* **Hay-scented-:** *Dennstaedtia punctilobula.* **Holly-:** *Cyrtomium falcatum*, and species of *Polystichum.* **Interrupted-:** *Osmunda Claytoniana.* **Licorice-:** *Polypodium glycyrrhiza.* **Lady-:** *Athyrium Filix-femina.* **Lip-:** *Cheilanthes.* **Maidenhair-:** *Adiantum.* **Male-:** *Dryopteris Filix-mas.* **Marsh-:** *Dryopteris Thelypteris.* **New-York-:** *Dryopteris noveboracensis.* **Oak-:** *Dryopteris.* **Oak-leaved-:** *Polypodium quercifolium.* **Ostrich-:** *Pteretis.* **Parsley-, American:** *Cryptogramma acrostichoides.* **Rattlesnake-:** *Botrychium virginianum.* **Resurrection-:** *Polypodium polypodioides.* **Royal-:** *Osmunda regalis.* **Sago-:** *Cyathea medullaris.* **Saw-:** *Blechnum serrulatum.* **Sensitive-:** *Onoclea sensibilis.* **Shield-:** *Polystichum Braunii.* **Silver-:** *Pityrogramma.* **Squirrels-foot-:** *Davallia bullata.* **Staghorn-:** *Platycerium.* **Strap-:** *Polypodium Phyllitidis.* **Strawberry-:** *Hemionitis palmata.* **Sweet-:** *Comptonia asplenifolia.* **Sword-:** *Nephrolepis.* **Tongue-:** *Cyclophorus Lingua.* **Tree-:** *Alsophila, Cyathea.* **Walking-:** *Camptosorus.* **Wall-:** *Polypodium vulgare* and *virginianum.* **Water-:** *Ceratopteris.* **Winter-:** *Conium maculatum.* **Wood-:** *Dryopteris.*

FERNS. Formerly included in the one family *Filices*, but now distributed in several families, as *Polypodiaceæ* which includes most of the common ferns, *Cyatheaceæ* comprising most of the tree-ferns, *Osmundaceæ*, the native royal-ferns and similar kinds, *Schizæaceæ* including the climbing ferns of the Lygodium class. Ferns are perennial plants widely spread in temperate and tropical regions, of perhaps 6,000 or more species.

Gardeners recognize two groups of ferns, the hardy kinds often transplanted from the wild and given conditions as nearly as possible like those in which they grew, and the glasshouse kinds of tropical and warm-temperate origin and that require more or less special skill in the growing. All kinds are raised for the gracefulness and beauty of the foliage, and the gardener therefore aims at luxuriousness in vegetation. They do not arrive at the best state in a dry or parched atmosphere or when exposed to wind. Some kinds, however, withstand untoward and changing conditions, and these are adapted to window gardens and porches; the Boston-fern (Nephrolepis) is one of this class.

In all fern culture, standing water in the pot is to be avoided, as also heavy clay soils. Extremes should be avoided, in air temperature and in moisture conditions. Shade should be provided and protection from wind. For living-room ferns a night temperature of about 55° is to be recommended, with a rise of 10–20° by day in bright weather. Soils for pot ferns should be fibrous; gardeners like to mix fine fibry peat or turfy loam with it; ample drainage should be provided in the bottom. See that the pot does not dry out, or the atmosphere become very dry.

Ferns are propagated by division, by the buds or offsets that form on the fronds of some kinds, and by means of spores. The spores are usually borne on the back of the frond or leaf; when ripe they may be shaken off on paper, or parts of the frond may be cut and placed in dishes or paper bags in a dry protected place until the spores shed. They should be sown on fine sterilized moist soil in well-drained pans or pots. Spores are sown on a well-prepared soil surface and not covered with earth or watered on top; the pans or pots are kept in a close propagating frame until germination takes place, when more air may be admitted. The frame or house may be kept at a temperature of about 65° F. When watering becomes necessary, sterile water should be used. The sporelings should be pricked out—usually at first in little clumps—and transplanted as soon as a deft person can handle them and the first regular foliage appears. From eight months to a year are usually required to produce good ferns from spores.

One desiring a list of the ferns in cultivation, may find the names of the genera under Cyatheaceæ, Marattiaceæ, Ophioglossaceæ, Osmundaceæ, Parkeriaceæ, Polypodiaceæ, Schizæaceæ, and then trace the species in each genus. Any of the native ferns, however, may be transplanted to grounds in the same region.

Plants allied to ferns are in the families Equisetaceæ, Lycopodiaceæ, Marsileaceæ, Salviniaceæ, Selaginellaceæ. The so-called asparagus-fern, common in conservatories and windows, is one of the Lily family, *Asparagus plumosus*.

The American Fern Society publishes a journal.

FEROCACTUS. *Cactaceæ.* Very spiny often large cacti, globular to cylindric, separated from Echinocactus by the axils of the scales on the ovary and fl.-tube being naked rather than woolly, and thick-walled dry fr.; S. U. S. and Mex. They are grown like the echinocacti and are adaptable to similar uses. See *Cacti.*

acanthodes (*Echinocactus acanthodes. E. cylindraceus*). Globular but becoming cylindric and 8 or 9 ft. tall, very spiny, ribs up to 27, spines pinkish to red to white, radials very weak, centrals awl-like: fls. 2 in. long more or less, bell-shaped, yellow to orange. S. Nev. and Calif., Lower Calif.

Covillei. Globular to short-cylindric, to 5 ft., ribs 22–32, spines red to white, radials 5–8 and centrals solitary: fls. 2–3 in. long, red tipped yellow. Mex.

glaucescens (*Echinocactus glaucescens*). Globular, 8–16 in. diam., or sometimes higher than broad, glaucous, ribs 11–15, radials 6, central solitary: fls. nearly 1 in. long, yellow. Mex.

hamatacanthus (*Echinocactus hamatacanthus. E. longihamatus*). Globular to oblong, to 2 ft. high, ribs 13 or 17, radial spines about 12 and needle-like, centrals 4: fls. about 3 in. long, yellow. S. Tex., New Mex., Mex.

Johnsonii (*Echinocactus Johnsonii*). Oblong, to 8 in. high, very spiny, ribs 17–21, radials 10–14, centrals 4–8 and longer and stouter: fls. 2–2½ in. long, deep red to pink. Utah, Nev., Ariz., Calif.

latispinus (*Echinocactus latispinus*). Globular or somewhat depressed, to 16 in. high, ribs 15–23, radials 6–10, centrals 4 or more and stouter: fls. 1 in. or a little more long, bell-shaped, rose to purple. Mex.

Lecontei (*Echinocactus Lecontei*). Cylindric or becoming so, 6–7 ft. high, ribs 20–30, some of the radials bristle-like, others and centrals flattened and mostly appressed: fls. yellow or red, 2 in. or more long. Utah, Ariz., Calif., Mex.

melocactiformis (*Echinocactus melocactiformis*). Cylindric, to 2 ft. diam., bluish-green, ribs about 24, spines 10–12, with 3 or 4 of them more or less central, yellow to brown: fls. 1–1½ in. long, bright yellow and perhaps reddish outside. Mex.

nobilis. Globular, ribs 15, radial spines straight, central solitary: fls. 1–1½ in. long, red with white margins. Probably Mex.—A doubtful plant.

peninsulæ (*Echinocactus peninsulæ*). Cylindric to club-shaped, to 8 ft. or so, ribs 12–30, spines red with yellow tips, radials 11, centrals 4: fls. yellow. Lower Calif.

robustus (*Echinocactus robustus*). Makes large clumps with hundreds of branches, ribs 8, radials about 10 and often thread-like, central about 6 and awl-like: fls. about 1½ in. long, yellowish. Mex.

Stainesii (*Echinocactus Stainesii. E. pilosus*). Globular to columnar, to 4 ft. or more, ribs 13–20, radial spines represented by long white hairs, centrals several: fls. yellow. Mex.

uncinatus (*Echinocactus uncinatus*). Short-cylindric, to 8 in. high, bluish and slightly glaucous, ribs commonly 13, areoles with flat yellow glands surrounded by yellow hairs, central spine usually solitary: fls. about 1 in. long, brownish. W. Tex., Mex.

viridescens (*Echinocactus viridescens*). Nearly globose or somewhat flattened, to 15 in. diam., deep green, ribs 13–21, bearing spines and felt, the spines at first red: fls. greenish-yellow, about ¾ in. long. Calif., Lower Calif.

Whipplei: *Sclerocactus Whipplei.*

Wislizeni (*Echinocactus Wislizeni*). Becoming cylindric, at length elongated and 7 ft. or more, ribs often 25, radials thread-like or needle-like or absent in young plants, centrals several: fls. 2 in. or more long, yellow. W. Tex. to Ariz. and Mex.

FERONIA. *Rutaceæ.* One spiny deciduous tree, **F. Limonia**, the Wood-Apple, of India and Indo-China, planted somewhat in Fla. and Calif. for interest and edible frs.: lvs. small, odd-pinnate, lfts. obovate and obtuse or emarginate, rachis and petiole margined: fls. dull red, in panicles, stamens 8–12: fr. globose or oblate, hard-shelled, to 3 in. diam., with pinkish edible acid pulp used in making jellies; seeds woolly. Suggested as a citrus stock.

FERONIELLA. *Rutaceæ.* Small genus much like Feronia, but evergreen, seeds smooth and the woody rind comprised of a radical structure. **F. lucida** is somewhat known in this country for ornament and as an experimental stock for citrus frs.: small spiny tree: lvs. small, odd-pinnate, lfts. oval or obovate, obtuse or emarginate, rachis and petiole pubescent: fls. white: fr. globose, to nearly 3 in. diam., pulp glutinous and eaten in Java where it is native.

FERTILE: producing their normal sex products, said of pollen-bearing stamens and seed-bearing fruits; a plant that bears good seeds (not sterile).

FERULA. *Umbelliferæ.* Per. thick-rooted herbs with pinnately decompound lvs., small yellow or greenish fls. in compound umbels, and ovate compressed frs.; one species is planted for ornament, others yielding medicines and gums; the edible fennel is Fœniculum. Propagated by seeds sown in spring where plants are to grow.

communis. Common Giant Fennel. To 12 ft.: lvs. very finely divided into linear segms. S. Eu. to Syria.—A striking plant with very finely divided foliage and umbels above it.

FESCUE: *Festuca.*

FESTUCA. Fescue. *Gramineæ.* Mostly tufted per. grasses of temp. regions, with flat or involute lvs. and spikelets borne in narrow panicles; grown in pastures, meadows, lawns, and some kinds planted for ornament. The principal meadow and forage species are *F. elatior*, *F. ovina*, *F. rubra.* See *Grasses.*

alpina: confused name.

amethystina. To 2½ ft.: lvs. about 1 ft. long, involute: panicles about 3 in. long. S. Eu., Asia Minor.

arundinacea. To 6 ft.: lvs. several ft. long and to ⅜ in. wide, flat: panicles to 10 in. long. Eu.

capillata: *F. ovina* var.

duriuscula: *F. ovina* var.

elatior (*F. pratensis*). Tall F. Meadow F. To 5 ft.: lvs. to 1 ft. long and ⅓ in. wide, flat: panicles to 1 ft. long, erect or nodding at top. Eu.; nat. in N. Amer.

geniculata (*F. stipoides*). To 1½ ft.: lvs. to 1 ft. long and ⅛ in. across, flat: panicles to 4 in. long, with awns ¼ in. long, heavy for size of plant. W.Medit. region.

gigantea. To 4 ft.: lvs. to 1 ft. long and ½ in. wide, flat: panicles to 1 ft. long, awns ½ in. long. Eu.; nat. in E. N. Amer.

glauca: *F. ovina* var.

heterophylla: *F. rubra* var.

Myuros. Rats-tail F. Ann. to 2 ft.: lvs. to 5 in. long, involute: panicles to 1 ft. long, one-sided, awns ¼ in. and more long. Eu.; nat. in N. Amer.

ovina (*F. vulgaris*). Sheeps F. To 2 ft.: lvs. to 8 in. long, involute: panicles to 6 in. long, short-awned. Eu., Asia; nat. in N. Amer. Var. **capillata** (*F. capillata, F. tenuifolia*) has hair-like lvs. and awnless spikelets. Var. **duriuscula** (*F. duriuscula*), Hard F., has stiff lvs. Var. **glauca** (*F. glauca*), Blue F., has glaucous foliage.

pratensis: *F. elatior.*

rigida: *Scleropoa rigida.*

rubra. Red F. To 3 ft., stoloniferous: lvs. to 6 in. long, involute: panicles to 5 in. long, sometimes reddish or glaucous, short-awned. Eu., Asia, N. Amer. Var. **heterophylla** (*F. heterophylla*) has basal lvs. involute and st.-lvs. flat.

stipoides: *F. geniculata.*

tenuifolia: *F. ovina* var. *capillata.*

vulgaris: *F. ovina.*

FETERITA: *Holcus Sorghum* var. *caudatus.*

FETID: having a disagreeable odor.

FETTER-BUSH: *Lyonia lucida.*

FEVERFEW: *Chrysanthemum Parthenium.*

FEVERWORT: *Triosteum.*

FICARIA: *Ranunculus Ficaria.*

FICUS. Fig. *Moraceæ.* Trees, shrubs and woody root-clinging vines, with milky sap, and minute fls. and seeds inside a globular or oblong or pyriform fleshy receptacle (or fig) that has a small opening at the apex: lvs. thick or stiff and mostly persistent, often large and showy. Species numerous, native in warm and trop. countries in many parts of the world. Some of the species are among the wonders of the vegetable world, as the banyan (*F. benghalensis*) that sends down aerial roots that make trunks and thus extend the top of the single tree over great areas; others begin as epiphytes, and after strangling the host become self-supporting and make independent trees. Many of the kinds emit aerial roots. In the following entries the lvs. are persistent (evergreen) unless otherwise noted. Other species than those listed here are to be expected within the limits of the U. S.; frs. as well as lvs. are necessary for identification.

Several kinds of ficus trees are planted for shade and ornament in the southermost parts of the United States, and they are frequent in the tropics. The creeping fig, commonly but erroneously known as *F. repens*, is used for covering walls far south, and often also in conservatories. The rubber plant, *F. elastica*, is one of the most popular and indestructible house plants and is grown in great quantities by florists; it is propagated by air-layering, which consists in tying a ball of moss about a young shoot that has been notched or cut for the formation of roots, the shoot being severed from the parent branch when the part is well rooted. Tall and ungainly pot specimens may be shortened in this way, by layering them under the leaves; but it is usually better to discard the old plant and to purchase a new one.

The arboreous species of Ficus also may be grown in the South from air-layers; a small notch is cut in a shoot, moss is placed in the notch and also made into a ball around the place, the work is kept wet for two weeks or so, and then the shoot may be severed and established in a pot. The trailing kinds grow from division of the rooting stems.

Afzelii: *F. eriobotryoides.*

altissima. Large spreading tree with few aerial roots: lvs. thick, oval or elliptic, blade 4–6 in. long: fr. about ¾ in. diam. India.

aurea. Epiphytal at first, making a tree to 60 ft.: lvs. oblong and narrowed at both ends: fr. sessile or nearly so, ⅓ in. diam., yellow. S. Fla.

australis: *F. rubiginosa.*

benghalensis. Banyan. Very large tree, top spreading by secondary trunks: lvs. broad-ovate to elliptic, 4–8 in. long: fr. in pairs, globose, red, about ½ in. diam. India.

benjamina. Large broad shining tree with graceful drooping branches, poplar-like: lvs. oval to elliptic, 2–5 in. long, narrowed to short but not sharp point: fr. becoming red, in var. **comosa** ¾ in. diam., yellow. India.

brevifolia (*F. populnea*). Epiphytal, making tree to 50 ft.: lvs. broadly ovate, cordate at base: fr. on drooping stalks, to ½ in. long, red. S. Fla.

Cannoni. Perhaps *Artocarpus Cannoni*, although greenhouse material under this name seems not to be the same.

carica. FIG (common or pomological F.). Broad irregular deciduous tree to 25 or 30 ft.: lvs. thick, rough above and pubescent underneath, deeply 3–5-lobed: fr. large, variable, edible. Medit. region. See *Fig*.

Chauvierii. Hort. name for a plant something like *F. elastica* with broader oval lvs. with lighter veins: fr. large, red. Perhaps New Caledonia.

clavata. Erect shrub: lvs. oblong-lanceolate or oblanceolate, 4–5 in. long, cuspidate or caudate: fr. about ½ in. diam., yellow. India.

Cunninghamii. Glabrous tree to 80 ft.: lvs. ovate to oblong-elliptic, abruptly acuminate, to 5 in. long and about 2 in. broad, thick, shining above: fr. 1 or 2 in axils, sessile, globular, white becoming purplish, nearly ½ in. diam. Queensland.

diversifolia (*F. lutescens*). MISTLETOE F. Shrub or small tree: lvs. variable, mostly broadly obovate and broad on top, to 2 in. long: fr. ⅓ in. or less diam., yellow. Malaya.—Sometimes grown as pot plant.

elastica. RUBBER-PLANT. Large glabrous tree but grown in its juvenile state as a pot and tub plant: lvs. thick and glossy, oblong or elliptic, 5–12 in. long: fr. about ½ in. long, yellowish. India, Malaya. There is a form with variegated lvs.

eriobotryoides (*F. Afzelii*). Large tree, with lvs. at ends of branches: lvs. stiff, long-oblanceolate, to 1 ft. long and 4 in. broad, lighter colored underneath: fr. to 1½ in. diam., yellow-hairy. Trop. Afr.

falcata. Creeping and rooting, with slender hairy sts.: lvs. thick, oblong and usually angled, unequal-sided, obtuse, 1 in. or less long: fr. ½ in. long, brown or orange. Malaya.—Grown sometimes under glass.

glomerata. CLUSTER F. Thick-topped tree: lvs. ovate to oblong, to 6 or 7 in. long, with strong lateral nerves: fr. about 1 in. diam., reddish, in clusters. India.

Hookeri. Glabrous tree: lvs. broadly elliptic, 5–11 in. long, pale underneath, with short broad apex: fr. to 1 in. diam., in a cup formed of the bracts. India.

indica. Large spreading glabrous tree: lvs. oblong, 4–7 in. long, acuminate, reddish when young: fr. ⅓ in. diam., yellowish-red, with rather large ovate acute bracts at base. Burma, Malaya.—Some of the trees known under this name may be *F. retusa*.

infectoria (*F. lucescens*). Deciduous tree: lvs. thin, ovate or somewhat oblong, 3–5 in. long, base broad: fr. ¼ in. diam., whitish tinged and dotted red. India.

lucescens: *F. infectoria*.

lutescens: *F. diversifolia*.

lyrata (*F. pandurata*). Close-headed tree to 40 ft.: lvs. large, 10–15 in. long, fiddle-shaped, apex large and rounded: fr. nearly 2 in. diam., with white dots. Trop. Afr.—Popular in juvenile state under glass, and grown in open in S. Fla.

macrophylla. MORETON BAY F. Large tree: lvs. oval to broad-oblong, blunt or nearly so or apex very short, to 10 in. long and 4 in. broad, brownish underneath: fr. to 1 in. diam., purple spotted white, peduncled. Queensland.

minima: *F. pumila* var.

Nekbudu (*F. utilis*). Large forest tree with pubescent young parts: lvs. thick, elliptic or nearly obovate, 6–15 in. long, rounded or broad at both ends: fr. about ½ in. diam., pubescent or woolly. Trop. Afr.—Sometimes grown under glass in juvenile state and planted in open far S.

nitida: *F. retusa*.

pandurata: *F. lyrata*.

Parcelli. Shrub, probably deciduous in the open: lvs. thin, ovate or oblong, acuminate, hairy at least underneath, oblique at base, 4–8 in. long, marbled creamy-white: fr. about ½ in. diam., peduncled, in different colors. Pacific Isls.

populnea: *F. brevifolia*.

princeps. Tree or shrub, listed in Calif.: lvs. long-ovate to oblanceolate, to 15 in. or more long, obscurely 5–7-nerved, short-acuminate, cuneate at base, entire; petiole 5–6 in. long; stipules lanceolate, glabrous, or hairy inside. Brazil.

pseudopalma. Shrub or small tree, mostly unbranched with stiffish long lvs. clustered at top and solitary or twin frs. in the axils: lvs. to 2 ft. or more long and 4 in. broad, acuminate, long-tapering to base, coarsely notched, the young ones very slender. Philippines.

pumila (*F. repens*). Creeping, and clinging to walls by means of roots, the fruiting branches erect: lvs. on creeping sts. 1 in. or less long and cordate-ovate, those on fruiting sts. 2–4 in. long and elliptic or oblong and not cordate: fr. to 2 in. long, yellowish, pyriform. China, Japan, Australia. Common in greenhouses and in the open far S. Var. **minima** is a slender small-lvd. form of the creeping stage.

quercifolia. Shrub, more or less prostrate: lvs. elliptic or ovate, lobed and notched on sides, 2–6 in. long: fr. to ½ in. diam., peduncled. Burma.—Grown under glass.

radicans. Trailing: lvs. oblong-lanceolate, about 2 in. long, base rounded or notched. Origin unrecorded.—Useful in vases; a form with variegated foliage.

religiosa. PEEPUL. BO-TREE. Large glabrous tree: lvs. round-ovate with a projection or tail half as long as body of blade: fr. ½ in. diam., purple. Sacred tree of India.

repens: *F. pumila*.

retusa (*F. nitida*). Attractive glabrous thick-topped evergreen tree much planted for shade and avenues in American tropics and also in S. Fla.: lvs. small, broadly ovate or somewhat rhomboid, 2–4 in. long: fr. ⅓ in. long, yellow or reddish, with obtuse bracts at base. India, Malaya.

Roxburghii. Low spreading tree or great bush: lvs. broad-ovate to nearly orbicular, to 15 in. long and 12 in. broad, pubescent underneath: fr. 2 in. diam., depressed-globose, brown or purplish, borne in clusters on trunk and branches. India.

rubiginosa (*F. australis*). Broad tree, top spreading by means of aerial roots, but often remaining bushy: lvs. oval or elliptic, 3–4 in. long, rusty-pubescent underneath: fr. ⅓ in. diam., warty. Australia.

sapida. Glabrous tree: lvs. oblong-lanceolate, 2–3 in. long and to 1 in. broad, acuminate: fr. globular, to nearly ½ in. diam., peduncled. Costa Rica.

Sycamorus. SYCAMORE. Round-headed large tree: lvs. ovate and subcordate, 3-ribbed, 4–10 in. long: fr. in leafless clusters, about ¾ in. long, edible. Egypt, Syria.—In S. Fla. usually deciduous in early spring and late summer, the new lvs. coming at same time.

textilis: listed name.

ulmifolia. Tall rough-twigged shrub or somewhat tree-like: lvs. various, mostly oblong or elliptic, 5–7 in. long, very rough on both surfaces, dentate or sometimes lobed: fr. about ½ in. long, orange-red or purplish. Philippines.

utilis: *F. Nekbudu*.

velutina. Tree: lvs. oblong, short-acute or obtuse, 4–5 in. or more long, obtuse or subcordate at base, glabrous above and rusty soft-pubescent underneath, petiole pubescent and 1 in. long. Colombia.

villosa. Scandent or creeping shrub: lvs. ovate-oblong or longer, 5–7 in. long, rounded at base, acuminate, brownish-velvety underneath as are also the shoots: fr. ½ in. diam., yellow, in clusters. Malaya.

Wendlandi: a hort. name.

FIDDLE-WOOD: *Citharexylum spinosum*.

FIESTA-FLOWER: *Nemophila aurita*.

FIG. The pomological or commercial fig is not a fruit in the strict botanical sense but a hollow fleshy receptacle with the many true fruits or "seeds" on the inside of it, and an opening at the top through which passes the insect that pollinates the minute flowers. The fig fruit grows on the young shoots as if it were a branch. The cultivated fig is one of the great genus Ficus (*F. carica*), which see.

It is a small very broad tree or large bush with soft wood.

Propagation is by means of hardwood cuttings taken in autumn, much after the way of grapes. In two to four years, bearing plants may be expected. The trees are usually planted about 18 to 25 feet apart. Figs stand considerable frost, and seedling or inferior varieties grow out-of-doors without protection as far north as Virginia and Maryland. Many of the varieties fruit on young sprouts, and, inasmuch as the roots endure cold, these varieties may give a few figs in the northern states. Figs have been fruited in the open ground in Michigan with good winter protection. In cold countries the figs should be laid down in winter, particularly if the temperature is likely to go ten degrees below frost. For such treatment the trees are made to branch close to the ground, and the branches are then bent down and covered with earth and a mound is made over the central or trunk part. In Louisiana, Texas, California the fig is grown in regular orchard plantations for commercial purposes.

FIG, HOTTENTOT-: *Carpobrotus edulis.* **Indian-**: *Opuntia Ficus-indica.* **-Marigold**: *Mesembryanthemum.*

FIGWORT: *Scrophularia.*

FILAMENT: thread, particularly the stalk supporting the anther.

FILAREE: *Erodium cicutarium* and *moschatum.*

FILBERTS are fruits of species of Corylus (which see), particularly of *C. maxima* in which the husk is much longer than the nut itself; the nuts of other species are cobs (a form of *C. Avellana*) and hazelnuts. Some of the hazelnuts are native in America; but the usual filberts and cobs are European and western Asian. Filberts can be grown in this country, but in the East the yield has not been satisfactory as a rule, because of disease, lack of adaptable varieties, tenderness to northern climates, and perhaps other causes; it is probable, however, that many of the disabilities will be overcome with the breeding of adaptable varieties and further study of the subject. In parts of Oregon filbert growing on a considerable basis is now fairly well established. Filberts and cobnuts are not ordinarily distinguished in this country, but the true filbert is an oblong nut, whereas the cob is roundish and usually angular and contained in a shorter husk.

FILIFORM: thread-like, long and very slender.

FILIPENDULA. Meadowsweet. *Rosaceæ.* Per. herbs native in the north temp. zone, having alternate pinnate lvs., small fls. in large terminal panicles in late spring and summer, and 1-seeded achenes; grown in the hardy border. Propagated by seeds and by division of old plants.

camtschatica (*Spiræa camtschatica. S. gigantea*). To 10 ft.: lvs. with ovate-cordate 3–5-lobed terminal lft. and lateral lfts. usually wanting: fls. white. Manchuria, Kamtchatka.

hexapetala (*Spiræa* and *Ulmaria Filipendula*). Dropwort. To 3 ft., rootstock tuberous: lvs. fern-like, of numerous small pinnatifid lfts.: fls. white. Eu., Asia. Var. **flore-pleno** has double fls.

purpurea (*Spiræa palmata*). To 4 ft.: lvs. with large 5–7-lobed terminal lft. and few unlobed or no lateral lfts.: fls. pink or purplish. Japan. Var. **alba** has white fls. Var. **elegans** has white fls. with red stamens.

rubra (*Spiræa lobata*). Queen-of-the-Prairie. To 8 ft.: lvs. with large 7–9-parted terminal lft. and lobed lateral lfts.: fls. peach-blossom pink, with conspicuous stamens, very attractive. Pa. to Ga. and Ky. Var. **venusta** (*Spiræa venusta*) has deep pink fls.

Ulmaria (*Spiræa Ulmaria*). Queen-of-the-Meadow. To 6 ft.: lvs. with large 3–5-lobed terminal lft. and toothed lateral lfts., white-tomentose beneath: fls. white. Eu., Asia; nat. in E. N. Amer. Var. **aureo-variegata** has lvs. variegated with yellow. Var. **plena** has double fls.

FILIX: *Cystopteris.*

FIMBRIATE: fringed.

FINOCCHIO: *Fœniculum vulgare* var. *dulce.*

FIORIN: *Agrostis palustris.*

FIR: *Abies.* **China-**: *Cunninghamia.* **Douglas-**: *Pseudotsuga taxifolia.* **Joint-**: *Ephedra.* **Summer-**: *Artemisia sacrorum* var. *viride.*

FIRE-CRACKER, FLORAL: *Brevoortia Ida-Maia.*

FIRE-PLANT, MEXICAN: *Euphorbia heterophylla.*

FIRETHORN: *Pyracantha.*

FIREWEED: *Epilobium angustifolium.*

FIRMIANA. *Sterculiaceæ.* Trees with alternate lvs., unisexual or polygamous small fls. without petals in axillary panicles, and membranaceous fr. which opens into leaf-like carpels; grown in the S. as a shade or lawn tree. Propagated by seeds.

platanifolia: *F. simplex.*

simplex (*F. platanifolia. Sterculia platanifolia*). Chinese Parasol-Tree. Phoenix-Tree. To 50 ft., deciduous: lvs. platanus-like, palmately 3–5-lobed, to 1 ft. across: fls. small, greenish: fr. to 5 in. long, separating into 4 leaf-like bodies that bear the round wrinkled seeds along the margins. China, Japan. In var. **variegata** the lvs. are variegated with white.

FISSIPES: *Cypripedium acaule.*

FITTONIA. *Acanthaceæ.* Hairy low or creeping herbs with opposite entire lvs. having white or colored veins and small tubular 2-lipped fls. borne beneath bracts in slender spikes; native of S. Amer.

Fittonias are grown as choice foliage plants in the greenhouse, often under benches, and should be kept shaded and the temperature never allowed to drop below 55°. Propagated easily by stem-cuttings which should contain one joint.

argyroneura: *F. Verschaffeltii* var.

gigantea. To 1½ ft., erect: lvs. oval, dark green veined with carmine, short-pointed.

Verschaffeltii. Creeping and rooting: lvs. ovate or oval, to 4 in. long, dark green veined with deep red, obtuse. Var. **argyroneura** is veined with white and var. **Pearcei** is glaucous beneath with carmine veins.

FITZROYA. *Pinaceæ.* One evergreen tree or sometimes shrubby in cult. **F. cupressoides** (*F. patagonica*). Lvs. spreading or overlapping, ⅛ in. long, dark green above and with 2 white bands beneath: cones globose, ⅓ in. across. S. Chile. For cult. see *Conifers.* Adaptable only to the lower S. and Calif. It belongs to the Cupressus tribe, with Thuja and Chamæcyparis.

FIVE-SPOT: *Nemophila maculata.*

FLACOURTIA. *Flacourtiaceæ.* Shrubs or trees with alternate simple lvs., small bisexual or polygamous fls. in racemes or clusters, and fr. a berry-like drupe, the pulp of which is made into jams and preserves. It is not particular as to soil but will not withstand frost. Propagated by seeds and budding.

indica (*F. Ramontchi*). RAMONTCHI. GOVERNORS-PLUM. BATOKO-PLUM. To 25 ft., often with long slender spines: lvs. ovate, to 3 in. long: fls. yellowish: fr. deep maroon colored, to 1 in. across. S. Asia, Madagascar.

Ramontchi: *F. indica*.

sepiaria. Shrub, usually spiny: lvs. obovate, 1½ in. long: fr. ½ in. across. India.

FLACOURTIACEÆ. FLACOURTIA FAMILY. Trop. trees and shrubs of both hemispheres, of about 70 genera, characterized by alternate simple lvs., regular bisexual or unisexual fls. having 4 or more sepals and petals or without petals, numerous stamens, superior 1-celled ovary and fr. mostly a berry or drupe; placed near Cistaceæ in the series. Azara, Berberidopsis, Carrierea, Idesia, Oncoba and Poliothyrsis are cult. for ornament, Dovyalis (Aberia) and Flacourtia for the edible fr.; and Taraktogenos for the curative oil.

FLAG, BLUE: *Iris*. **Crimson**: *Schizostylis*. **Spiral**: *Costus*. **Sweet**: *Acorus Calamus*. **Yellow**: *Iris Pseudacorus*.

FLAMBOYANT: *Delonix regia*.

FLAME-TREE: *Brachychiton acerifolium*.

FLANNEL-BUSH: *Fremontia californica*.

FLAX. To gardeners the flaxes are annual and perennial plants grown for the bright showy bloom. They are species of Linum. The flax of commerce is *Linum usitatissimum*, an annual grown for two classes of products,—the fiber of the bast in the stem from which flax-fiber and fine linen are derived, and the seeds from which linseed oil and linseed cake and meal are manufactured. These are not horticultural products. In North America flax is raised mostly in Minnesota, the Dakotas and Canada. Seed is sown directly in the field when the weather is warm, as in May and June, and the crop should be ready in one hundred days or less.

FLAX, NEW ZEALAND: *Phormium tenax*. **Yellow**: *Reinwardtia indica*.

FLEABANE: *Erigeron*.

FLEECE-FLOWER: *Polygonum*.

FLEECE, MOUNTAIN: *Polygonum amplexicaule*.

FLEECE-VINE, CHINA: *Polygonum Auberti*.

FLEMINGIA. *Leguminosæ*. Herbs or shrubs, often twining, with lvs. commonly of 3 digitate lfts. but sometimes simple, red or purple papilionaceous fls. and short swollen pods; native in tropics of Old World and intro. in S. U. S.

strobilifera. Shrub to 10 ft.: lvs. simple, ovate, to 3½ in. long, silky beneath: fls. purple, hidden by large bracts, in racemes to 6 in. long: pods to ½ in. long. India, Malaya.

FLEXUOUS, FLEXUOSE: having a more or less zigzag or wavy form; said of stems of various kinds.

FLOATING HEART: *Nymphoides*.

FLOERKEA: *Limnanthes Douglasii*.

FLOPPERS: *Bryophyllum pinnatum*.

FLORAS-PAINTBRUSH: *Emilia sagittata*.

FLORETS: individual flowers of composites and grasses; also other very small flowers that make up a very dense form of inflorescence.

FLORIFEROUS: flower-bearing.

FLOSS-SILK TREE: *Chorisia speciosa*.

FLOWER-OF-AN-HOUR: *Hibiscus Trionum*.

FLOWER-OF-JOVE: *Lychnis Flos-Jovis*.

FLY-POISON: *Amianthium muscœtoxicum*.

FOAM-FLOWER: *Tiarella cordifolia*.

FŒNICULUM. *Umbelliferæ*. Herbs native in the Old World, having pinnately decompound lvs., small yellow fls. in compound umbels, and narrow prominently ribbed frs.; one species is grown for the lvs. and aromatic seeds which are used in flavoring; lvs. and lf.-bases sometimes eaten. Propagated by seeds in spring.

officinale: *F. vulgare*.

vulgare (*F. officinale*). FENNEL. Per. but grown as an ann., to 5 ft.: lvs. 3–4-pinnate into linear thread-like segms. S. Eu. Var. **dulce**, FLORENCE F. or FINOCCHIO, has the base of the lvs. much enlarged and thickened and, when blanched, serves as article of food. Var. **piperitum**, CAROSELLA, is grown for the young sts. which are eaten.

FOLIACEOUS: leaf-like; said particularly of sepals and calyx-lobes and of bracts that in texture, size or color look like small or large leaves.

FOLLICLE: dry dehiscent pericarp opening only on the front suture.

FONTANESIA. *Oleaceæ*. Two Asian deciduous somewhat Ligustrum-like shrubs with opposite entire lvs., small white fls. in narrow leafy panicles in May-June, and fr. a flat winged nutlet.

Fontanesias thrive in any good garden soil. Propagated by seeds, layers, and cuttings of green wood under glass.

californica: *F. Fortunei*.

Fortunei (*F. californica*). To 15 ft.: lvs. lanceolate or ovate-lanceolate, to 4 in. long, shining. China; hardy N.

phillyreoides. To 10 ft.: lvs. ovate-lanceolate to oblong, to 3 in. long, grayish-green. Asia Minor; less hardy.

FORCING. Plants are forced when made to grow or bloom outside their normal season, particularly in advance of the season, by some artificial means. The mere imitation of the natural conditions under which any plant grows may not constitute forcing. Growing in greenhouses is not necessarily forcing; it may be only protection. The word forcing has come to be associated with particular crops and sometimes quite independently of its proper restricted meaning; thus we speak of the forcing of tomatoes, cucumbers, melons, bulbs. A forcing-house is only a glass-house: its use determines its title or designation.

FORESTIERA (*Adelia*). *Oleaceæ*. American deciduous (seldom evergreen) trees or shrubs with opposite lvs., small yellowish diœcious or imperfect fls. without petals in clusters or racemes before the lvs., and fr. a small black or dark purple drupe with scant flesh. Only *F. acuminata* is hardy North without protection. They thrive best in moist locations. Propagated by seeds and layers.

acuminata. To 30 ft.: lvs. to 4 in. long, acuminate: fr. ½ in. long. Ill. to Ga. and Tex.

ligustrina. To 10 ft.: lvs. to 1½ in. long, obtuse: fr. ⅓ in. long. Tenn. to Fla.

neo-mexicana. To 10 ft.: lvs. to 1½ in. long, acute or obtuse: fr. ⅙ in. long. Tex. to New Mex. and Colo.

FORESTRY. The growing and utilizing of forests, with all the science, craft and commerce consequent thereto. The forest is a crop, making use of land, and is therefore agriculture in its broad sense. In its general relations it is also within the realm of political economy inasmuch as great permanent forests are almost necessarily public domains, and it is directly concerned in the conservation and utilization of natural resources as well as with governmental problems. These domains are to be kept and utilized in the interest of all the people, in consideration with all related questions. Silviculture is the science and practice of raising forests, one of the main departments or components of forestry. Arboriculture (which see) is properly not within the realm of forestry, although popularly confused with it, but rather a department of horticulture. Farm forestry is that smaller application having to do with the raising and using of wood-lots.

FORGET-ME-NOT: *Myosotis.* **Creeping:** *Omphalodes verna.*

FORSYTHIA. GOLDEN-BELLS. *Oleaceæ.* Deciduous shrubs of the Old World with opposite, simple or 3-parted lvs., showy yellow fls. deeply 4-parted into oblong corolla-lobes, appearing before the lvs., and fr. a woody caps. with winged seeds.

Forsythias are amongst the showiest spring-blooming shrubs and are hardy North. They are not particular as to soil. Propagated by cuttings of young wood in summer, of ripe wood in fall and winter, by seeds, and the drooping sorts by rooting at the tips.

europæa. To 6 ft., with erect branches having lamellate pith: lvs. to 3 in. long, entire or with few shallow teeth. Albania.

decipiens: *F. suspensa* var.

Fortunei: *F. suspensa* var.

intermedia. Hybrid between *F. suspensa* and *F viridissima:* to 10 ft., with arching or spreading branches having lamellate pith: lvs. to 5 in. long, sometimes 3-parted. Var. **primulina** has pale yellow fls. crowded at base of branches. Var. **spectabilis** has bright yellow fls. more than 1 in. long.

ovata. Very early: lvs. ovate to broad-ovate, to 2½ in. long, serrate, not lobed: fls. solitary, amber-yellow. Korea.

Sieboldii: *F. suspensa* var.

suspensa. To 10 ft., with hollow drooping branches: lvs. to 4 in. long, toothed, often 3-parted: fls. golden-yellow. China. Commonly planted. Var. **atrocaulis** has dark purple branchlets. Var. **decipiens** (*F. decipiens*) has solitary deep yellow fls. Var. **Fortunei** (*F. Fortunei*), is of more erect habit, often with 3-parted lvs. Var. **Sieboldii** (*F. Sieboldii*) has more slender drooping or trailing branches.

viridissima. To 10 ft., with erect branches having lamellate pith: lvs. to 6 in. long, toothed above middle: fls. greenish-yellow. China. In var. **variegata** the lvs. are variegated with white.

FORTUNELLA. KUMQUAT. *Rutaceæ.* Four known or recognized small evergreen fruit-trees or shrubs native probably in S. E. China, differing from Citrus in few-celled ovary with but 2 ovules in each cell, characteristic hollowed stigma and smaller frs. Grown in the orange belt, but somewhat hardier than the sweet orange particularly when grown on trifoliata (Poncirus) stock: lvs. lanceolate or somewhat broader. The attractive aromatic frs. are used for preserves and may be eaten raw. Kumquats make ornamental tub plants. Full grown plants reach a height of 10 or 12 ft. They hybridize with other citrus fruits; see *Citrangequat* and *Limequat.* For general culture, consult *Citrus fruits,* page 155.

crassifolia. MEIWA K. Shrub, with or without spines: lvs. thick and trough-like, petioles narrowly winged: frs. slightly ovoid, to 1½ in. diam., cells 6 or 7; pulp-vescicles oval or ovate.

Hindsii. Spiny small tree, wild on Hongkong and adjacent mainland, grown somewhat for curiosity: lvs. oval-elliptic, petiole winged: fr. less than 1 in. diam., subglobose, orange-red, with 3 or 4 cells, with few nearly juiceless small pulp-vescicles.

japonica (*Citrus japonica*). ROUND and MARUMI K. Much branched shrub with or without spines: lvs. to 3 in. long, blunt-pointed and relatively broad: fr. round, to about 1¼ in. diam., without rudiments of style, and 5–6 cells.

margarita. OVAL and NAGAMI K. Shrub or small tree, nearly or quite thornless: lvs. longer than in *F. japonica* and relatively narrower and more pointed: fr. oval or oblong, to 1 in. cross diam., with persistent rudiment of style, cells 4 or 5.

FOTHERGILLA. *Hamamelidaceæ.* N. American deciduous shrubs with alternate simple coarsely toothed witch-hazel-like lvs., white fls. without petals borne in dense terminal heads or spikes in which the stamens are the conspicuous part, and fr. a beaked caps.

Fothergillas are hardy and thrive in moist soils. Propagated by seeds, by layers which will not root for two years, and *F. Gardeni* by suckers and root-cuttings.

alnifolia: *F. Gardeni.*

carolina: *F. Gardeni.*

Gardeni (*F. alnifolia. F. carolina*). To 3 ft.: lvs. to 2 in. long, pale beneath: fls. before lvs. Va. to Ga.

major. To 10 ft.: lvs. to 4 in. long, glaucous beneath: fls. with lvs. Ga.

monticola. To 6 ft.: lvs. to 4 in. long, light green beneath: fls. with lvs. N. C. to Ala.

parvifolia. To 2 ft.: lvs. to 2¼ in. long, gray-pubescent beneath: fls. before lvs. N. C. to Fla.

FOUNTAIN-PLANT: *Russelia equisetiformis.*

FOUQUIERIA. *Fouquieriaceæ.* A few spiny shrubs or trees in Mex., one extending into the desert regions of S. W. U. S. and there planted for hedges. **F. splendens.** OCOTILLO. COACH-WHIP. VINE-CACTUS. JACOBS-STAFF. Shrub of many sts. to 20 ft. with slender rigid spines bearing clusters of small lvs. in their axils which soon fall: fls. scarlet, to 1 in. long, the stamens exserted, in terminal racemes or panicles to 10 in. long: fr. ¾ in. long. For *F. columnaris,* see *Idria.*

FOUQUIERIACEÆ. FOUQUIERIA FAMILY. Two genera of spiny trees and shrubs, often leafless, with bisexual fls. having 5 sepals, 5-lobed corolla, 10–17 stamens, superior 3-celled ovary and capsular fr. It has mostly been associated with Tamaricaceæ, but has lately been placed in the sequence near Polemoniaceæ. Fouquieria and Idria are sometimes planted.

FOUR-O'CLOCK: *Mirabilis Jalapa.*

FOXGLOVE: *Digitalis.*

FOXTAIL, MEADOW: *Alopecurus pratensis.*

FRAGARIA. Strawberry. *Rosaceæ.* Low per. herbs with rooting runners, lvs. of 3 lfts., white or reddish sometimes more or less imperfect fls. in small clusters on radical peduncles, and fr. a berry formed of the fleshy receptacle bearing the seed-like frs. on the surface; a few grown for ornament and the edible fr. For cult. see *Strawberry.*

californica. To 5 in.: lfts. silky-pubescent beneath: fls. ½ in. across: fr. ½ in. across, the achenes in shallow pits. Calif.

chiloensis. To 8 in.: lfts. thick and glossy, silky beneath: fls. to 1 in. across: fr. ¾ in. across, the achenes in shallow pits. Alaska to Patagonia. Var. **ananassa** comprises most of the common garden strawberries, with larger frs.; hybridization may have modified them.

elatior: *F. moschata.*

Grayana: *F. virginiana* var. *illinoensis.*

illinoensis: *F. virginiana* var.

indica: *Duchesnea indica.*

mexicana. To 4 in.: lfts. silky beneath: fls. about ⅓ in. across: fr. ⅓ in. across, the achenes superficial. Mex.

moschata (*F. elatior*). Hautbois S. To 1 ft.: lfts. silky beneath: fls. usually diœcious, standing above foliage: fr. musky, the achenes superficial, hull strongly reflexed. Eu.

vesca. To 1 ft.: lfts. slightly silky beneath: fls. ½ in. across: fr. sometimes white, ½ in. across, the achenes superficial. Eu.; nat. in E. N. Amer.—Here belong the races of strawberries known as Alpine, Everbearing and Perpetual.

virginiana. To 8 in.: lfts. becoming glabrous: fls. to ¾ in. across: pedicels bearing appressed hairs: fr. ½ in. across, the achenes in deep pits. Stout forms with spreading hairs on the pedicels are known as var. **illinoensis** (*F. illinoensis, F. Grayana*). E. N. Amer.—Supposed to have entered into some of the garden strawberries.

FRANCISCEA: *Brunfelsia.*

FRANCOA. *Saxifragaceæ.* Herbaceous perennials from Chile with lyrate lvs. and terminal dense racemes of white or pink fls.; suitable for outdoor planting in mild climates. Propagated by seeds sown in spring in a cool house or frame; also by division.

appendiculata. To 2½ ft.: fls. pale rose, usually not spotted.

glabrata: *F. ramosa.*

ramosa (*F. glabrata*). To 3 ft.: infl. pubescent; fls. white, in spikes 2 ft. long and 1 in. thick.—The sprays of fls. are much used for table decoration; incorrectly called Bridal Wreath. Var. **hybrida** has larger pure white fls.

sonchifolia. To 2 ft.: lf.-stalks with broad wings at base: fls. pink marked with darker color.

FRANGIPANI: *Plumeria.*

FRANKENIA. *Frankeniaceæ.* Evergreen more or less heath-like per. herbs or subshrubs with small entire lvs. opposite or in 4's, small inconspicuous fls., and capsular frs.; seldom grown under glass and perhaps in the open in mild regions.

pulverulenta. Sts. straggling, to 1½ ft. long: lvs. many, to ¼ in. long, close together: fls. pink, less than ¼ in. long. S. Eu. to India, S. Afr.

FRANKENIACEÆ. Frankenia Family. Herbs or subshrubs of 4 genera in warm countries, with often heath-like lvs., small bisexual fls. having 4–7 sepals and petals, mainly 6 stamens, superior 1-celled ovary, and fr. a caps. inclosed in the calyx. In natural sequence it is placed near Hypericaceæ and Tamaricaceæ. Frankenia may be cult.

FRANKLINIA: *Gordonia alatamaha.*

FRASERA. Columbo. *Gentianceæ.* N. American large stout herbs with opposite or whorled simple and entire lvs. that are mostly basal, and white, yellowish or bluish fls. in panicled clusters on tall single sts.; corolla rotate and 4-parted; sometimes transplanted from the wild and usually of simple handling.

Parryi (*Swertia Parryi*). To 3 ft.: lvs. to 8 in. long, white-margined: fls. greenish-white, the lobes spotted with black around the yoke-shaped fringed gland, in broad panicles to 1 ft. long. S. Calif.

speciosa (*Tessaranthium speciosum. Swertia radiata*). To 5 ft.: lvs. to 1 ft. long: fls. greenish-white spotted with purple, with fringed glands, in narrow panicles to 2 ft. long. Ore. to Mont. and Calif.

FRAXINELLA: *Dictamnus albus.*

FRAXINUS. Ash. *Oleaceæ.* Deciduous trees with opposite mostly pinnate lvs., small not showy bisexual or unisexual fls. in panicles and in some species in early spring before the lvs., and fr. a 1-seeded winged samara; mostly native in the north temp. zone but some of them extending to the tropics. Shade and timber trees are in the genus, and many interesting hort. forms. The following species are hardy N. unless otherwise stated.

Ashes are valuable as street or lawn trees and succeed in good fairly moist soil. They transplant readily. Propagated by seeds which should be stratified and sown the following year. The named sorts are grafted in spring on seedling stocks or budded in summer.

alba: *F. americana.*

americana (*F. alba. F. novæ-angliæ*). White A. To 120 ft.: lvs. of 5–9 lfts. to 6 in. long, glaucous beneath: fls. diœcious, before the lvs., without petals, the calyx persistent on fr.: fr. linear-oblong, to 2 in. long. N. S. to Fla. and Tex. Var. **ascidiata** has lfts. somewhat hollow or pitcher-shaped at base. Var. **subcoriacea** has thick lfts. silvery-white beneath.

angustifolia. To 75 ft.: lvs. of 7–13 lanceolate lfts. to 3 in. long: fls. before the lvs., without calyx or corolla: fr. oval-oblong, to 1½ in. long. S. Eu., N. Afr., W. Asia; not hardy N. Var. **lentiscifolia** (*F. lentiscifolia*) has lfts. further apart. Var. **australis** (*F. australis*) has lfts. slightly pubescent beneath.

anomala. Single-leaf A. To 20 ft., with slightly winged branchlets: lvs. usually of 1 broad-ovate lft. to 2½ in. long: fls. with the lvs., without petals, the calyx persistent on fr.: fr. oblong, ¾ in. long. Colo. to Calif.; not hardy far N.

arbutifolia: *F. pennsylvanica.*

atrovirens: *F. excelsior* var. *crispa.*

aucubæfolia: *F. pennsylvanica* var.

australis: *F. angustifolia* var.

Biltmoreana. To 50 ft.: lvs. of 7–11 lfts. to 6 in. long, pubescent beneath: fls. diœcious, before the lvs., without petals, with calyx persistent in fr.: fr. linear-oblong, to 1½ in. long. N. J. to Ga. and Ala.

Bungeana. To 15 ft.: lvs. usually of 5 broad-ovate lfts. to 1½ in. long: fls. with or after lvs., with petals: fr. oblong, 1 in. long. China.

californica: *F. oregona.*

caroliniana (*F. platycarpa*). Water A. To 50 ft.: lvs. of 5–7 lfts. to 5 in. long: fls. diœcious, before the lvs., without petals, the calyx persistent on fr.: fr. oval to oblong, to 2 in. long, winged to base. Swamps, Va. to Fla. and Tex.; not hardy in the N.

chinensis. To 50 ft.: lvs. of 5–9 lfts. to 4 in. long: fls. with or after lvs., without petals, with calyx: fr. lanceolate, to 2 in. long. China. Var. **rhynchophylla** has larger lvs.

cuspidata. To 20 ft.: lvs. of 7 lfts. to 2½ in. long: fls. fragrant, with or after lvs., with petals united into tube: fr. oblong, 1 in. long. Tex. to Mex.; to be planted only far S.

dipetala. To 15 ft., with 4-sided branchlets: lvs. usually of 5 lfts. to 1¾ in. long: fls. with the lvs., with 2 white petals: fr. oblanceolate, 1 in. long. Calif.; to be planted only in mild climates.

Elonza. Small tree, the branchlets with whitish warts: lvs. of 9–13 lfts. to 3 in. long: fr. oblong. Of uncertain origin.

excelsior. EUROPEAN A. To 140 ft., with black buds: lvs. of 7–11 lfts. to 5 in. long: fls. before lvs., without calyx or corolla: fr. oblong, 1½ in. long. Eu., Asia Minor. A few of the hort. vars. are: **asplenifolia**, lfts. linear; **aurea**, branchlets yellow; **aurea-pendula**, branchlets yellow, drooping; **aurea-variegata**, lvs. variegated or edged with yellow; **crispa** (var. *atrovirens*, var. *cucullata*), lfts. small and curled or twisted; **diversifolia** (var. *simplicifolia laciniata*, *F. monophylla*, *F. heterophylla*), lvs. of 1–3 cut-toothed lfts.; var. **erosa**, lfts. narrow, jagged or cut-toothed; **nana** (*F. polemoniifolia*), dwarf, lfts. small; **pendula** (var. *Wentworthii*), branches drooping; **spectabilis**, habit pyramidal; **verrucosa**, branches warty; **verticillata** (*F. verticillata*), lvs. clustered.

floribunda. To 120 ft.: lvs. of 7–9 lfts. to 6 in. long, the rachis slightly winged: fls. with or after lvs., in panicles to 1 ft. long, with corolla: fr. linear, about 1 in. long. Himalayas; adapted only far S.

Greggii. To 25 ft.: lvs. of 3–7 leathery lfts. to ¾ in. long: fls. before lvs., without corolla, with calyx: fr. oblong, to ⅔ in. long. Tex., N. Mex.; to be planted only far S.

heterophylla: *F. excelsior* var. *diversifolia.*

lanceolata: *F. pennsylvanica* var.

lentiscifolia: *F. angustifolia* var.

longicuspis. To 50 ft.: lvs. of 5–7 lfts. to 4 in. long, the lowest pair much smaller: fls. with or after lvs., with corolla and minute calyx: fr. linear-oblong, 1½ in. long. Japan.

mandshurica. To 100 ft.: lvs. of 9–11 lfts. to 5 in. long, rusty-tomentose at base: fls. diœcious, before the lvs., without calyx or corolla: fr. oblong-lanceolate, to 1½ in. long. N. E. Asia.

Mariesii. To 25 ft.: lvs. usually of 3–5 close lfts. to 3 in. long, pale beneath: fls. with or after the lvs., with corolla and minute calyx: fr. oblanceolate, to 1 in. long, purplish. China; not hardy N.

monophylla: *F. excelsior* var. *diversifolia.*

nigra (*F. sambucifolia*). BLACK A. To 75 ft.: lvs. of 7–11 lfts. to 5 in. long, rusty-tomentose at base: fls. diœcious, before the lvs., without calyx or corolla: fr. oblong, to 1½ in. long, winged to base. Newf. to W. Va. and Ark., in low lands.

novæ-angliæ: *F. americana.*

oregona (*F. californica*). To 75 ft.: lvs. of 5–9 sessile lfts. to 6 in. long, pubescent beneath: fls. diœcious, before the lvs., without petals, with calyx: fr. 2 in. long, winged nearly to base. Wash. to Calif.; not hardy far N.

Ornus (*Ornus europæa*). FLOWERING A. To 60 ft.: lvs. usually of 7 lfts. to 3 in. long: fls. fragrant, with the lvs., with linear white petals and with calyx: fr. linear or lanceolate, 1 in. long. S. Eu., W. Asia.

oxyacanthifolia: *F. xanthoxyloides.*

parvifolia: *F. rotundifolia.*

Paxiana. To 60 ft.: lvs. of 7–9 sessile lfts. to 7 in. long: fls. with or after lvs., with corolla and large calyx: fr. linear, 1 in. long. China, Himalayas.

pennsylvanica (*F. pubescens. F. arbutifolia. F. Richardi*). RED A. To 60 ft.: lvs. of 5–9 lfts. to 6 in. long, pubescent beneath: fls. diœcious, before the lvs., without petals, with calyx: fr. to 2½ in. long, winged nearly to base. N. S. to Ga. and Miss. Var. **aucubæfolia** has lvs. mottled with yellow. Var. **lanceolata** (*F. lanceolata. F. viridis*). GREEN A. Lfts. narrower, pubescent only on midrib beneath. Me. to Fla. and Tex.

platycarpa: *F. caroliniana.*

platypoda. To 70 ft.: lvs. of 7–11 sessile lfts. to 4 in. long, petioles enlarged at base: fls. diœcious, before the lvs., without petals, with calyx: fr. oblong, to 2 in. long, winged to base. China.

polemoniifolia: *F. excelsior* var. *nana.*

potamophila. To 30 ft.: lvs. of 9–11 lfts. to 2 in. long: fls. before the lvs., without calyx or corolla: fr. oblong, to 2 in. long. Turkestan.

pubescens: *F. pennsylvanica.*

pubinervis. Tree: lvs. of 5–11 lfts. to 4 in. long: fls. with lvs., having corolla: fr. oblanceolate, 1½ in. long. Japan.

quadrangulata. BLUE A. To 80 ft. or more, the branches 4-angled: lvs. of 7–11 lfts. to 5 in. long: fls. bisexual, before the lvs., without calyx or corolla: fr. oblong, to 2 in. long, winged to base. Mich. to Ark.

Richardi: *F. pennsylvanica.*

rotundifolia (*F. parvifolia*). To 15 ft.: lvs. of 7–13 sessile lfts. to 1¼ in. long: fls. before the lvs., without calyx or corolla: fr. oblong, 1¼ in. long. S. Eu., W. Asia; hardy in cent. region. Var. **pendula** has drooping branches.

sambucifolia: *F. nigra.*

sogdiana. Small tree: lvs. of 7–11 lfts. to 2½ in. long: fls. before the lvs., without calyx or corolla: fr. oblong, 1½ in. long. Turkestan.

syriaca. Small tree: lvs. of 3–5 lanceolate lfts. to 4 in. long: fls. before the lvs., without calyx or corolla: fr. obovate, to 1½ in. long. Asia.

texensis. To 50 ft.: lvs. of usually 5 lfts. to 3 in. long: fls. diœcious, before the lvs., without petals, with calyx: fr. oblong, to 1 in. long. Tex.

velutina. To 50 ft.: lvs. of 3–5 lfts. to 1½ in. long, pubescent beneath: fls. diœcious, before the lvs., without petals, with calyx: fr. oblong, ½ in. long. Ariz., New Mex.; not hardy N.

verticillata: *F. excelsior* var.

viridis: *F. pennsylvanica* var. *lanceolata.*

xanthoxyloides (*F. oxyacanthifolia*). Small tree: lvs. of 5–9 lfts. to 1½ in. long, the rachis winged: fls. before the lvs., without petals, with calyx: fr. linear-oblong, to 2 in. long, winged to base. W. Asia; not hardy N.

FREESIA. *Iridaceæ.* S. African tender herbs with bulb-like corms, linear basal and st.-lvs., and white or yellow, very fragrant, erect funnelform fls. in raceme-like spikes which are bent at right angles to st.

Freesias are forced under glass for the late winter and early spring bloom, but bulbs do not withstand the previous potting and cold treatment required by hyacinths and tulips. They should be kept cool and moist when growing, and the soil well drained. Bloom may be expected ten or twelve weeks after planting if bulbs are strong. Several bulbs or corms are planted together in pots, pans or boxes. Started in late winter or early spring, they are useful for porch- and window-boxes. After blooming and ripening, gradually dry off the plant, shake out the corms and keep for subsequent planting. Seeds should give blooming corms in second or third year. The offsets reproduce the stock rapidly.

Armstrongii. Differs from *F. refracta* in having fls. with white tube orange at base and segms. margined with rose-purple.

hybrida. A hort. group containing many hybrid or variant forms known as "colored freesias," the fls. variously tinted and veined with shades of rose, purple, brown, blue and orange.

refracta. To 1½ ft.: fls. greenish-yellow to bright yellow, to 2 in. long, the segms. unequal. Var. **alba** has white fls. with gradually narrowed tube while the white fls. of var. **xanthospila** have abruptly narrowed tube. The fls. of var. **Leichtlini** are pale yellow and abruptly narrowed and of var. **odorata** bright yellow.

FREMONTIA (*Fremontodendron*). *Sterculiaceæ.* Two evergreen shrubs with alternate usually palmately lobed lvs., showy yellow fls. without petals, solitary in the axils, and capsular fr. **F. californica.** FLANNEL-BUSH. To 10 ft.: lvs. to 1 in. long, densely tomentose beneath: fls. to 2 in. across. Calif. **F. mexicana** differs in the glands at the base of the calyx not being hairy. S. and Lower Calif.—Fremontias require rather dry soil. They are not hardy N. Propagated by seeds or cuttings of green wood under glass.

FREMONTODENDRON: *Fremontia.*

FREYCINETIA. *Pandanaceæ.* Diœcious shrubs climbing or scrambling, largely in Australia and New Zeal., of many species, the sts. rooting: lvs. long-linear and mostly serrate or spinescent, sheathing at base: fls. in terminal spadices: fr. an aggregate oblong mass or cone of woody or somewhat fleshy berry-like bodies. **F. Banksii** is a tall climber on trees and over rocks, the spinose-serrate lvs. towards ends of branches. New Zeal.

FRINGE-BELL: *Schizocodon soldanelloides.*

FRINGE-TREE: *Chionanthus.*

FRITILLARIA. FRITILLARY. *Liliaceæ.* Bulbous simple-stemmed herbs with alternate or whorled lvs. and nodding bell-shaped often oddly colored fls. solitary or in racemes or umbels, the perianth-segms. distinct; native in north temp. zone.

Most of the species are hardy and of easy cultivation in good garden soil; they are usually early spring-flowering. Most kinds should be lifted and divided every two or three years. Propagated by offsets, rarely by seeds.

agrestis. STINK BELLS. To 1½ ft.: lvs. oblanceolate, mostly near base of st.: fls. yellowish-green, to 1¼ in. long, in 3–5-fld. racemes, having disagreeable odor. Calif.

camschatcensis. To 1½ ft.: lvs. lanceolate: fls. livid wine-purple, 1¼ in. long, in 1–3-fld. racemes. Siberia.

coccinea: *F. recurva* var.

delphinensis: *F. tubæformis.*

glauca. To 8 in.: lvs. oblong-lanceolate, glaucous: fls. purple marked with greenish-yellow, ¾ in. long, in 1–3-fld. racemes. Ore.

imperialis. CROWN IMPERIAL. To 4 ft., having strong odor: lvs. lanceolate: fls. purplish, brick- or yellow-red, to 2 in. long, borne on curved stalks under a whorl of lvs. at top of st. Persia.—An interesting old-fashioned plant, persisting for years.

japonica. Low: lvs. lanceolate: fls. yellow spotted with brown, drooping, solitary and terminal. Japan.

lanceolata. To 2 ft.: lvs. ovate-lanceolate: fls. dark purple mottled with greenish-yellow, to 1½ in. long, in 1–4-fld. racemes. B. C. to Calif. Var. **gracilis** has smaller fls.

liliacea. WHITE F. To 1 ft.: lvs. linear to oblanceolate: fls. dull white, ¾ in. long, fragrant, in 1–5-fld. racemes. Calif.

meleagris. CHECKERED-LILY. SNAKES-HEAD. To 1½ ft.: lvs. linear to oblanceolate: fls. checkered and veined with purplish or maroon, to 3 in. across. in 1–3-fld. racemes. Eu., Asia. Var. **alba** has white fls. and **purpurea** purplish.

pallidiflora. To 15 in.: lvs. oblong, the upper lanceolate: fls. yellow, checkered inside, 1½ in. long, in 1–6-fld. racemes. Siberia.

parviflora. To 2½ ft.: lvs. linear or linear-lanceolate: fls. purplish or greenish, ½ in. long, in long racemes. Calif.

pluriflora. PINK F. ADOBE-LILY. To 1 ft.: lvs. oblong-lanceolate: fls. pink-purple, to 1¼ in. long, in 4–12-fld. racemes. Calif.

pudica (*Ochrocodon pudicus*). YELLOW F. To 9 in.: lvs. narrowly oblanceolate: fls. yellow or orange tinged with purple, ¾ in. long, in 1–3-fld. racemes. B. C. to Calif. and N. Mex.

pyrenaica. To 1½ ft.: lvs. linear, glaucous: fls. dark purple spotted with green, usually solitary. Pyrenees.

recurva. SCARLET F. To 2½ ft.: lvs. linear to linear-lanceolate: fls. scarlet checkered with yellow, to 1½ in. long, in 3–6-fld. racemes. S. Ore. to Calif. Var. **coccinea** has more brilliantly scarlet fls.

tenella. To 1 ft.: lvs. linear: fls. purple outside or yellowish-green spotted with purple, inside yellowish spotted purple, 1 in. long, solitary or in pairs. S. E. Eu.

tubæformis (*F. delphinensis*). To 1 ft.: lvs. oblanceolate to linear: fls. purple spotted and checkered with yellow, often solitary. Alps.

FRŒLICHIA. *Amaranthaceæ.* American ann. or bien. herbs, woolly or silky, with opposite lvs. and small fls. in dense spikes borne in panicles; of little ornamental value but may be listed.

floridana. Ann. to 6 ft.: lvs. few, linear, to 5 in. long: spikes to 2½ in. long. Ga., Fla.

FROGS-BIT: *Hydrocharis.*

FROND: leaf of fern, and frequently applied to palms and similar plants; sometimes used in the sense of foliage.

FRUIT: the ripened pericarp or pericarps with the adnate parts; the seed-bearing organ or body. In horticultural usage, a fruit is an edible body or product developed from a flower, independently of its morphology, sometimes with other parts associated with the seed-bearing organ.

FUCHSIA. *Onagraceæ.* Shrubs and trees native in Mex. to S. Amer. and New Zeal., but usually treated under glass essentially as herbs, with simple lvs., usually showy hanging fls. in shades of rose, red and purple, sometimes white, exserted stamens and pistil, and fr. a berry.

Fuchsias are grown in the cool greenhouse and often bedded out in summer, and in mild climates they are outdoor subjects. They are sometimes trained to large pyramids with a central stem; and when grown permanently in the open they are useful for covering walls and fences. For window-garden and conservatory use in pots new plants are commonly started each year. Propagated by cuttings of soft green wood in pots or boxes or on benches. If plants are to be kept over winter, the branches should be cut back after blooming.

arborescens (*F. syringæflora*). To 18 ft.: lvs. lanceolate-oblong, to 8 in. long: fls. pink or purplish, ½ in. long, in erect terminal panicles. Mex.

coccinea. Lvs. narrow-ovate, about 2 in. long, pointed, dentate, with very short hairy petioles, twigs also hairy: fls. 1–3 in the axils, the narrow pointed sepals scarlet, petals purplish, rolled and much shorter. Probably Brazil.—The name *coccinea* may be applied to forms of *F. magellanica.*

conica: *F. magellanica* var.

corallina: hort. form of *F. magellanica.*

corymbiflora. To 6 ft., requiring support: lvs. ovate-oblong, large: fls. deep red, to 4 in. long, in long drooping corymbs. Peru. Var. **alba** is listed.

excorticata. Tree to 40 ft.: lvs. ovate-lanceolate, to 5 in. long: fls. to 1¼ in. long, petals small. New Zeal.

fulgens. To 4 ft.: lvs. broadly ovate, to 7 in. long: fls. red, to 3 in. long, in short racemes. Mex.

globosa: *F. magellanica* var.

gracilis: *F. magellanica* var.

hybrida (*F. speciosa*). Lvs. ovate, to 4 in. long: fls. with crimson calyx and purple, rose or white petals, sometimes double, to 3 in. long, stamens long-exserted. Various cultigens; probably of hybrid derivation from forms of *F. magellanica* and *F. fulgens;* common in conservatories and windows.

lycioides: *F. rosea.*

macrostemma: *F. magellanica.*

magellanica (*F. macrostemma*). To 20 ft. when trained on walls but usually a low shrub, thinly pubescent or glabrous: lvs. ovate-lanceolate, to 2 in. long, sinuate-dentate: fls. with red calyx and blue petals, 1–2 in. long, the stamens long-exserted. Peru to Tierra del Fuego. Var. **conica** (*F. conica*) has ovate lvs., the scarlet calyx-tube widest at base, and dark purple petals. Var. **globosa** has ovate lvs. and small red-purple fls. with nearly globose buds. Var. **gracilis** is a slender graceful form with scarlet calyx and purple petals. Var. **Riccartoni** grows to 10 ft. high and is very floriferous.—This species, in various forms, is much planted in the open in Calif.

microphylla. To 6 ft.: lvs. ovate or round, less than 1 in. long: fls. deep red, ½ in. long, drooping. Mex., Cent. Amer.

minima: a listed name.

parviflora. Shrubby: lvs. small, the obtuse mostly entire blades oval and less than 1 in. long on longer petioles: fls. less than ½ in. long, pink and purple, solitary, sepals reflexed. Mex.

procumbens. TRAILING F. Sts. prostrate and trailing: lvs. round-ovate, ¾ in. long: fls. pale orange with purple calyx-lobes, petals lacking, to ¾ in. long, erect and solitary. New Zeal.

pumila: probably one of the many forms of *F. magellanica*.

recurva: listed name.

reflexa: listed name.

Riccartoni: *F. magellanica* var.

rosea (*F. lycioides*). Shrub with horizontal branches: vs. oval to lanceolate, more or less acute, entire, about 1 in. or less long: fls. small, axillary, sepals becoming reflexed, the shorter corolla purple-violet. Chile.

serratifolia. Tall shrub: lvs. oblong to lanceolate, toothed, pale beneath with reddish midvein and petioles: fls. with calyx red at base becoming pink and white at tips. Peru.

speciosa: *F. hybrida*.

splendens. Lvs. broadly ovate, to 5 in. long: fls. scarlet with small greenish petals, to 1½ in. long, the stamens long-exserted. Mex., Guatemala.

syringæflora: *F. arborescens*.

tenella: hort. form of *F. magellanica*.

Thompsonii: form of *F. magellanica* var. *gracilis*.

thymifolia. To 3 ft.: lvs. ovate-lanceolate or orbicular, to 2 in. long: fls. purplish-red, ½ in. long. Mex.

triphylla. To 1½ ft.: lvs. oblanceolate, small: fls. cinnabar-red, 1½ in. long, in terminal racemes. W. Indies. Var. **purpurascens** is listed.

FUCHSIA, CALIFORNIA: *Zauschneria californica*. Cape: *Phygelius capensis*.

FUGACIOUS: falling or withering away very early.

FUMARIA. FUMITORY. *Fumariaceæ*. Ann. and bien. herbs with soft finely dissected lvs. and small 1-spurred fls. in racemes; occasionally grown for medicinal uses. Propagated by seeds.

officinalis. To 3 ft. producing small underground tuber: fls. purplish tipped with crimson. Eu.; nat. in N. Amer.

FUMARIACEÆ. FUMITORY FAMILY. Five genera of herbs native in the north temp. zone and S. Afr., allied to the Poppy family, having dissected thin or flaccid lvs., irregular bisexual fls. with 2 scale-like sepals, 4 petals of which the 2 inner are crested and one or both of the outer spurred, 6 stamens, superior 1-celled ovary, and capsular frs. The genera Adlumia, Corydalis, Dicentra are cult. to some extent for ornament, and one Fumaria is officinal.

FUMITORY: *Fumaria*. Climbing: *Adlumia fungosa*.

FUNASTRUM: *Philibertia clausa*.

FUNGI AND FUNGICIDES. Plant life in its complexity ranges all the way from the oak tree with its millions of cells divided into specialized tissue to the single-celled bacterium that may be too small to be seen except under the very highest power of the microscope. But size may make no fundamental difference for both these types of plants live, breathe, and use food for growing and reproducing. One difference, however, between the higher and the lower types is of great importance to the gardener—the presence or absence of the green coloring matter that enables the plant to manufacture its own food. Such plant-forms as slime-molds, bacteria, and true fungi do not have this substance, and are therefore dependent on other plants or animals for their food. Certain of them live on dead organic matter and are then known as saprophytes; many of these are of great assistance to man, for they aid in such important processes as making bread, curing cheese, tanning leather, fermenting sugars and in many other ways. On the other hand, those that attack living plants or animals, and which are known as parasites or pathogenes, may cause the loss of a crop. Among such organisms are those that cause the wilt of eggplant, the black-leg of cabbage, the late blight of potato and the blight of the chestnut tree.

Slime-molds (myxomycetes) are nothing more than a naked mass of protoplasm that engulfs the small particles that it digests. When time comes to fruit, the mass is broken up into innumerable small pellets which become inclosed in a wall and serve as a resting stage until there is a favorable time for reproduction. This pellet or spore, as the fruit-body of a mold is known, then swells until it bursts, thereby liberating another minute mass of protoplasm that may gain entrance into the tissue of a living plant and cause such a disease as club-root of cabbage or the powdery scab of potatoes.

Bacteria that cause plant diseases are rod-shaped bodies with more or less rounded ends, and far too small to be seen by the unaided eye. The different species vary in size but one-ten-thousandths of an inch in length and half that in width is not unusually small. The bacteria reproduce by fission, in which each individual merely divides in the middle and each offspring repeats the operation. This multiplication proceeds so rapidly that colonies an inch in diameter may soon be formed. Among the bacterial diseases of plants are crown-gall of many crops, black-rot of cabbage, angular leaf-spot of cucumbers, Stewart's sweet corn disease, and more than two hundred other plant troubles.

True fungi usually are composed of spider-web-like threads, as those of bread mold. Each type of fungus has its characteristic way of fruiting which may differ as widely in appearance as does a bean seed and an acorn. The spores usually are extremely abundant. They germinate by sending out a tube that may enter the plant epidermis directly or pass through a breathing-pore or wound. The smuts of grain, late blight of potatoes, spotting of the bean pods, blackening of rose leaves, and the scabbing of apples are a few of the almost endless list of diseases caused by fungi.

A few diseases of plants are caused by animals. The most common example is the root nematode that causes swellings on the roots of many plants. In the North it is found only in the greenhouses where the ground does not freeze, but in the South it may attack most of the garden crops.

A very destructive group of diseases is the result of organisms or substances known as virus. The virus is carried in the sap of the diseased plant, and in most cases is disseminated by means of sucking insects, especially aphids. The virus destroys or injures the green coloring matter in small sections of the leaf, so that the foliage becomes mottled with yellow and sometimes much distorted because of uneven growth. Among such diseases are mosaic, leaf-roll, and yellows.

Diseases exhibit various types of symptoms. Some of them result in spots or blotches on the leaves, others produce cankers on the stems and roots, others spotting of the fruit or tubers, and many cause wilting and dying of branches, vines or whole plants. Complete descriptions of the symptoms even of the most common plant maladies would require a large volume. Therefore if a rot, scab, canker, blight, mildew, or wilt is present on any particular crop, and the grower is not sure of the cause, he should have his County Agricultural Agent visit him to aid in making the diagnosis and prescribing control measures, or he should send fresh material to his State Agricultural College, United States Department of Agriculture or other agency, for identification.

Growers sometimes think that weather and the soil are the cause of disease, but this is not the case; yet many parasites are very susceptible to the influence of temperature, humidity and soil reaction. Bean anthracnose, late blight of potatoes, and downy-mildew of cucurbits are a few of the many diseases that are more severe in rainy weather. Other troubles, as potato scab, are worse in dry weather. Onion smut is not present in the far South because it needs low temperature for best development. Tomato wilt, on the other hand, rarely is found in the northern tier of states and Canada. Club-root of cabbage requires an acid soil for severe infection and is controlled by a heavy application of hydrated lime, while potato scab increases rapidly as the soil becomes more alkaline. Similarly, many other disease organisms differ in their environmental requirements so that each horticulturist should become familiar with the conditions that check the growth of any given parasite.

The mode of dissemination of parasites is very important to the grower; he may be able to hinder their entrance into his soil or his vegetable seeds. Among the agents of dissemination are splashing rain, running water, wind, moving soil, cultivation, animals, tools, seeds, tubers, cuttings, manure, diseased plant refuse, weeds, and insects. A few parasites are distributed by nearly all these agencies, but it is more common for each organism to have a specific means of getting from one place to another, and here is an opportunity of checking its spread.

The wintering period is a time when many pathogenes may be attacked successfully if the grower is acquainted with the place and the stage in which the organisms live. Most of them are able to remain alive in old diseased leaves or other plant parts. Many are carried on or in the seed or tubers. Other ways of wintering are in the soil, in hibernating insects, in living roots of weed hosts, on alternate hosts, and in cankers of living plants.

To kill the pathogenes, the seeds or tubers may be treated, the soil sterilized, or the growing plants sprayed or dusted. The materials employed in these processes are known as fungicides, and are relatively few in number. The common ones are copper, sulfur, mercury, formaldehyde, and heat as hot water, steam or dry air.

Copper is employed mostly in the form of copper sulfate (blue vitriol) which, after being dissolved in water, is mixed with a lime suspension to make bordeaux mixture. When this suspension is broken up into a fine mist under high pressure and is sprayed over the leaves, it dries on so firmly that it does not wash off even during the heaviest rains. Sometimes the copper sulfate is heated to drive off most of the water that may be present, and then is ground into an extremely fine dust which is mixed with hydrated lime, or with lime and calcium arsenate, to be used as a copper-lime dust in the place of the liquid spray. Copper in the copper carbonate form occasionally is mixed with the surface soil in the greenhouse or hotbeds to hinder damping-off of young plants. The same preparation may be dusted on seeds to kill fungi or bacteria.

Sulfur is used chiefly in spraying fruit-trees rather than vegetables. Commercial firms boil it with lime and make what is known as lime-sulfur, which is diluted with water and applied as a spray. In some greenhouses electric hot plates are placed at intervals and pure sulfur is heated in dishes set on the plates. This liquid sulfur floats through the air until it covers plants growing there and which need protection. Sulfur also is applied as dust, being first ground very fine and then used alone or mixed with a filler. This fungicide is very toxic against all powdery-mildew fungi, but is almost worthless against downy-mildew.

Mercury is employed in many forms, but particularly as mercuric chloride (corrosive sublimate). One tablet is dissolved in a pint of water or 1 ounce in 7½ gallons of water to make the usual concentration of 1-1000. Seeds and tubers are dipped in this solution for disinfection. It may also be sprinkled on the surface soil of greenhouses to aid in controlling damping-off. It is very poisonous. Mercurous chloride (calomel) has been used for tuber disinfection and also as an application on lawns where the grass has been killed by a fungus. Commercial firms make many forms of organic mercury compounds for disinfecting seeds or sterilizing soil.

Formaldehyde in various dilutions is employed for treating seeds and for disinfecting soil. In seed treatment it has been replaced to a great extent by corrosive sublimate. In soil disinfection, 1 gallon of formaldehyde is mixed with 49 to 99 gallons of water depending on the severity of the disease to be combated. One-half gallon to 1 gallon of the dilute solution is poured over each square foot of the soil to be treated. The soil is then covered for twenty-four hours after which the fumes are permitted to escape before seeds are planted.

When fungi are difficult to kill with chemicals or when they grow under the seed-coat, heat is applied for tuber and seed disinfection. The cabbage black-leg organism can be destroyed only by dipping the seed in hot water (122° F.) for twenty or more minutes. Loose smuts of wheat and barley require a similar treatment, although not so long. Potatoes are treated by heating the corrosive sublimate or the formaldehyde solutions in which they are to be disinfected. Steam is forced into the soil either through pipes or under a steam pan to kill the soil pathogenes that may be present. Such soil sterilization is of particular importance in greenhouses where cropping continues throughout the year and long crop rotations cannot be practiced. See *Insects and Insecticides.*

FUNKIA: *Hosta.*

FUNNELFORM: with tube gradually widening upward and passing insensibly into the limb like a trumpet, as in many flowers of Convolvulus; infundibuliform.

FURCRÆA. *Amaryllidaceæ.* Succulent plants native in the warm parts of Amer., having lvs. in basal rosettes and whitish or greenish fls. in terminal panicles on tall scapes, the perianth-segms. slightly united at base; they usually bloom only once and then die. Bulblets are commonly borne in the fl.-clusters. Cult. as for *Agave*, from which the Furcræas differ in the rotate whitish fls. rather than funnelform and colored and in character of stamens; propagated by bulblets.

altissima: *F. inermis.*

Bedinghausii. Trunk to 3 ft.: lvs. to 2 ft. long and 3 in. wide, rough-margined: infl. to 15 ft.; fls. 1½ in. long. Mex.

gigantea. Nearly trunkless: lvs. to 8 ft. long and 8 in. wide, with few distant prickles: infl. to 25 ft.; fls. 1½ in. long. Brazil. Var. **medio-picta** (*F. Watsoniana*) is unarmed and is variegated with cream-color.

inermis (*F. altissima*). Trunk very short: lvs. to 3 ft. long and 3 in. broad, nearly entire: infl. to 10 ft. high; fls. 1 in. long. Trop. Amer.

Lindenii: *F. Selloa* var. *marginata.*

pubescens. Nearly trunkless: lvs. to 5 ft. long and 3 in. broad, toothed: infl. to 20 ft. high; fls. 2¼ in. long. Mex.

Roezlii. Trunk to 6 ft.: lvs. to 4 ft. long and 5 in. wide, rough-margined: infl. to 15 ft.; fls. 1¾ in. long. Mex.

Selloa. Trunk to 5 ft.: lvs. to 4 ft. long and 3 in. wide, with curved teeth: infl. to 20 ft. high; fls. 1½ in. long. Colombia. Var. **marginata** (*F. Lindenii*) has lvs. margined with white or yellow.

Watsoniana: *F. gigantea* var. *medio-picta.*

FURROWED: with longitudinal channels or grooves.

FURZE: *Ulex.*

FUSIFORM: spindle-shaped; narrowed both ways from a prominent or swollen middle, as dahlia roots.

FUSTIC: *Chlorophora tinctoria.*

G

GACHIPAES: *Guilielma Gasipaes.*

GAGEA. *Liliaceæ.* Small bulbous herbs of Eu., N. Afr. and Asia, with usually 1 developed lf. to a bulb, the others forming bracts under the umbel of mostly yellow fls., the perianth-segms. distinct. Cult. as for *Ornithogalum.*

lutea: *G. silvatica.*

silvatica (*G. lutea*). To 1 ft.: lf. to 1½ ft. long and ⅓ in. wide: fls. yellow, ½ in. long, in umbels of 1–7, in spring. Eu. to Himalayas.

GAILLARDIA. *Compositæ.* American herbaceous annuals, biennials and perennials with alternate and basal lvs., toothed and spotted or dotted, and large showy solitary heads, the rays yellow and red, 3-toothed, the disk purple; pappus of awned scales.

Gaillardias grow best in light open well-drained soil and full sunlight, and are favorites for cut-flowers. The annual species are propagated by seed sown in the open where the plants are to stand or started earlier under glass; the perennials by seeds, by cuttings in August or September, or by division; sometimes root-cuttings are employed in early spring.

amblyodon. Ann. to 2 ft., hairy: lvs. oblong, to 3 in. long, entire or nearly so, sessile and auriculate: heads 2 in. across, rays brown-red throughout. Tex.

aristata (*G. grandiflora. G. lutea. G. maxima. G. perennis*). Per. to 3 ft., hairy: lvs. lanceolate to spatulate, to 5 in. long, entire or pinnately cut: heads to 4 in. across, rays yellow. Minn. to B. C. and New Mex.

Drummondii: *G. pulchella.*

grandiflora: *G. aristata.*

kermesina splendens: probably a form of *G. aristata.*

Lorenziana. A form of *G. pulchella* var. *picta* with ray-fls. and sometimes disk-fls. enlarged and tubular.

lutea: *G. aristata.*

maxima: *G. aristata.*

perennis: *G. aristata.*

picta: *G. pulchella* var.

pulchella (*G. Drummondii*). Ann. to 20 in., soft-pubescent: lvs. oblong to spatulate, to 4 in. long, entire or cut: heads 2 in. across, rays yellow with rose-purple at base. Kans. and La. to Ariz. Var. **picta** (*G. picta*) has large heads in different shades.

sanguinea: a listed name.

GALACTITES. *Compositæ.* Thistle-like herbs native in the Medit. region, with purple heads in corymbs or panicles, the marginal fls. sterile and ray-like; pappus plumose. One species is sometimes grown for ornament. Propagated by seeds.

tomentosa. Ann. or bien. to 2 ft., sts. white-tomentose: lvs. pinnately lobed or parted into very spiny lobes, green and more or less white-marked above, white-tomentose underneath: heads to 1½ in. across, bracts of involucre spiny-tipped.

GALANTHUS. Snowdrop. *Amaryllidaceæ.* Spring-blooming bulbs with 2 or 3 basal lvs. and solitary white fls., the perianth-segms. distinct, the 3 inner ones overlapping and appearing tubular and thus differing from the snowflake or Leucojum. Hardy and of easy cult. in usual garden soil. Bulbs should be planted in autumn 3–4 in. deep. Other species than the following are offered abroad.

byzantinus. Lvs. broad, glaucous, with recurved margins: fls. with oblong white outer segms. ¾ in. long, inner segms. green. S. E. Eu.

Elwesii. Giant S. To 1 ft. and more: lvs. 8 in. long and ¾ in. across, very glaucous: fls. 1¼ in. long, the inner segms. green on sinuses and lower half. Asia Minor.

nivalis. Common S. To 1 ft.: lvs. to 9 in. long and ¼ in. wide: fls. 1 in. long, the inner segms. green on sinuses. Eu. to Caucasus.

GALATELLA: *Aster dracunculoides.*

GALAX. *Diapensiaceæ.* One stemless evergreen per. herb native from Va. to Ga., **G. aphylla.** Lvs. basal and tufted, heart-shaped to nearly orbicular, to 5 in. across, stiff, shining and turning a beautiful bronze color in autumn: fls. small, white, in spike-like racemes on scapes to 2½ ft. high. The lvs. are extensively collected for use in floral decorations, and the plant makes good ground-cover. Sometimes grown in rock-gardens and colonized in woods; hardy well N. Propagated by division.

GALAX, FRINGED: *Schizocodon soldanelloides.*

GALEANDRA. *Orchidaceæ.* Trop. American epiphytes with jointed leafy sts. and fls. in a loose terminal infl., the sepals and petals similar, the lip funnel-shaped; for cultural directions see *Orchids.*

lacustris. To 20 in.: lvs. about 10 in. long: fls. about 2 in. across, in pendulous racemes; sepals white- or violet-green; lip white veined with yellow and with yellow spur to 1 in. long, Apr.–June. Brazil.

GALEGA. *Leguminosæ.* Per. herbs with pinnate lvs., blue or white papilionaceous fls. in racemes, and cylindrical pods; grown for ornament. Seeds may be sown in spring where plants are to stand, or roots may be divided.

bicolor. To 3 ft.: lfts. oblong-linear: fls. with deep blue standard and bluish-white wings and keel. W. Asia.

officinalis. Goats-Rue. To 3 ft.: lfts. oblong, stipules lanceolate: fls. purplish-blue. Eu., W. Asia; hardy N. Var. **alba** or **albiflora** has white fls., **carnea** rose-colored double fls., and **Hartlandii** has variegated lvs. when young and lilac fls.

orientalis. To 4 ft.: lfts. ovate, stipules ovate: fls. purplish-blue, nodding. Caucasus.

persica: a confused name applied to a white-fld. form; possibly *G. officinalis.*

GALEORCHIS: *Orchis spectabilis.*

GALE, SWEET: *Myrica Gale.*

GALINGALE: *Cyperus.*

GALIUM. Bedstraw. *Rubiaceæ.* Slender mostly weak herbs with usually square sts., whorled sessile lvs. and very small deeply 4-parted wheel-shaped fls. in panicles; a few species sometimes grown in rock-gardens, and as cut-flowers to give a filmy effect in bouquets. Propagated by seeds and division; of ordinary cultural requirements.

boreale. NORTHERN B. Per. to 3 ft., stoloniferous: lvs. in 4's, lanceolate, to 1½ in. long: fls. white. N. N. Amer.

Mollugo. WHITE B. FALSE BABYS-BREATH. Per. to 3 ft.: lvs. in 8's or 6's, oblanceolate to linear, to 1 in. long, bristle-tipped: fls. white. Eu.; nat. in N. Amer.—Often confused with *Gypsophila paniculata*, although very different.

verum. YELLOW B. Per. to 3 ft., sts. often decumbent: lvs. in 8's or 6's, linear, to 1 in. long, bristle-tipped: fls. yellow. Eu.; nat. in N. Amer.

GALPHIMIA: *Thryallis.*

GALTONIA. *Liliaceæ.* S. African bulbous herbs with basal lvs. and white or greenish fls. in loose racemes terminating a tall scape, the perianth-segms. partially united.

Galtonias succeed in rich moist soil and in northern regions should be heavily mulched in winter. Propagated by offsets or by seeds.

candicans (*Hyacinthus candicans*). GIANT SUMMER-HYACINTH. To 4 ft.: lvs. to 3 ft. long and 2 in. across: fls. white, fragrant, to 1½ in. long, in summer or autumn.

GALVEZIA. *Scrophulariaceæ.* Shrubs with lvs. opposite or in 3's and corolla with palate more or less closing throat, saccate, gibbous or spurred at base: plants from Peru and Ecuador and from the Calif. region, allied to Antirrhinum.

speciosa (*Antirrhinum speciosum*). Evergreen shrub to 7 ft., glabrous or pubescent: lvs. in 3's, ovate, entire, to 1½ in. long: fls. scarlet, 1 in. long, saccate at base, in terminal infl. Isls. off Calif., and planted in those parts.

GAMOLEPIS. *Compositæ.* S. African small shrubs or herbs with alternate lvs., mostly pinnately cut, and yellow solitary heads of ray- and disk-fls.; pappus none. One species is grown for the fls., sometimes employed in edgings. Propagated by seeds.

Tagetes. Glabrous ann. to 1 ft., very floriferous: lvs. to 1½ in. long, pinnately parted into linear segms.: heads bright yellow or orange, ¾ in. across.

GAMOPETALOUS: corolla of one piece, as in morning-glory and snapdragon; petals united.

GARBANZO: *Cicer arietinum.*

GARBERIA. *Compositæ.* One branching shrub to 6 ft., native in Fla. and sometimes used in ornamental plantings. G. **fruticosa** (*Liatris fruticosa*). Lvs. alternate, spatulate or obovate, about 1 in. long, leathery, pale: heads pale purple or pink, about ½ in. long, in dense cymes, of disk-fls.; pappus of bristles.

GARCINIA. *Guttiferæ.* Trees of many species native in the tropics of the Old World, with opposite simple usually thick lvs., polygamous fls., and fr. a hard berry pulpy within; one species is grown for its edible fr. and the juice of others yields the gamboge of commerce; a number of the species give promise as pomological plants for occidental regions.

Mangosteens require a tropical climate and a moist but well-drained soil. Propagated by seeds which should be sown in pots and the seedlings shaded and grown to about 2 feet high before transplanting. As mangosteens root slowly, it is best to inarch on roots of related species of Garcinia. Budding may also be practiced.

Mangostana. MANGOSTEEN. To 30 ft.: lvs. leathery, glossy, with many cross veins, to 10 in. long: bisexual fls. rose-pink, 2 in. across: fr. reddish-purple, 2–3 in. across, having 5–7 white crimson-veined segms. resembling an orange. Malay region.—Highly prized where it can be grown but it is not yet much planted in American tropics; within the continental U. S., grown only under protection for its general interest. The fruit is highly desirable.

GARDEN. In its historical significance a garden is a plant-growing area of small or limited dimensions, usually inclosed, connected with a residence or having relationships with the family. Ornamental subjects, fruits and vegetables for household use, plantings constituting part of the setting for a home or building, are the essential components of it; and gardening is the rearing, establishing and maintenance of the plants and care of the area devoted to them. In modern time, however, the word garden has taken on an expanded meaning, involving much larger areas and commercial undertakings, and the older more restricted unit is often called the home garden. The kinds of plants or crops now constitute the main distinction between commercial gardening and agriculture, and there is no clear line of demarcation; yet one ordinarily and properly thinks of a home and a pleasure-ground, personal satisfactions, and a particular kind of skilled training, when employing the words garden, gardener, gardening. See *Horticulture*, *Landscape-Gardening*.

The home garden should be useful in the degree to which it expresses the sentiments of its maker or proprietor; a garden planned without regard to personality may not fulfill the requisite. To accomplish essential results the garden-maker must be well prepared to meet the requirements of the plants and to defend them against injury, insect and disease; to this end he must be informed by the latest bulletins and books on the subject.

GARDENIA. *Rubiaceæ.* Shrubs or small trees with lvs. opposite or in 3's and large yellow or white fls. solitary or in corymbs, with salverform or tubular corolla and 5–11-lobed limb; native in warm regions of eastern hemisphere.

Gardenias were formerly very popular greenhouse specimens and are now grown indoors for cut-flowers and out-of-doors in warm climates. They require a warm close house with a night temperature of about 65°. Buds should be kept pinched off until late in September when they are allowed to set, and will produce bloom for midwinter. Propagated by cuttings containing three or four buds and kept over bottom heat. Frequent syringing is employed.

florida: *G. jasminoides.*

Fortunei: *G. jasminoides* var. *Fortuniana.*

grandiflora. Tree: lvs. lanceolate, shining: fls. white, large, fragrant, 6-parted: fr. oblong. Cochin-China.—The plant cult. under this name is probably *G. jasminoides.*

jasminoides (*G. florida. G. radicans. Warneria* or *Varneria augusta*). CAPE-JASMINE. Evergreen shrub to 6 ft.: lvs. lanceolate or obovate, to 4 in. long, thick: fls. waxy-white, to 3 in. across, often double, fragrant: fr. ovate. China. Var. **Fortuniana** (*G. Fortunei*) has larger fls.

radicans: *G. jasminoides.*

Thunbergia. To 10 ft.: lvs. elliptic, to 6 in. long: fls. white, fragrant, 3–4 in. across and long-tubed, calyx spathe-like: fr. ovoid, woody, crowned with calyx, 2 in. or more long. S. Afr.

Veitchii: hort. name for a form of *G. jasminoides.*

GARDOQUIA BETONICOIDES: *Brittonastrum mexicanum.*

GARLAND-FLOWER: *Hedychium coronarium.*

GARLIC (*Allium sativum*). Rather small onion-like plant but with flat leaves and a thinly covered bulb that breaks up into separable parts or "cloves." The plant is native in southern Europe. For relationships, see *Onion.*

The bulbs are used in cookery. They are often seen in the stores in long braids, held together by their dry tops. Propagated by the cloves or bulblets, which are planted in early spring in any good garden land. Seed is not available, as it is rarely produced.

GARLIC, FALSE: *Nothoscordum.* **Giant:** *Allium Scorodoprasum.* **Wild:** *Allium canadense.*

GARRYA. SILK-TASSEL BUSH. The only genus of *Garryaceæ.* Evergreen shrubs native in W. N. Amer., having opposite unlobed lvs., unisexual fls. without petals borne in catkin-like racemes, and fr. a dry berry-like body.

Garryas are grown for ornament but not hardy North. They do best in sunny sheltered positions. Propagated by cuttings of half-ripened wood, by layers, and by seeds.

elliptica. To 8 ft. and more: lvs. elliptic, to 3 in. long, leathery, densely woolly beneath, becoming glabrous and shining above, wavy-margined: staminate catkins to 8 in. long; pistillate spikes dense, to 4 in. long. Ore. to Calif.

laurifolia (*G. macrophylla*). To 20 ft., shrub or tree-like, branchlets pubescent: lvs. oblong or narrower, to 6 in. long, glabrous or soon becoming so, mostly obtuse: lower bracts resembling the lvs. Mex.

macrophylla: *G. laurifolia.*

Thuretii. Hybrid between *G. elliptica* and a W. Indian species: lvs. long and narrow, to 4 in.: pistillate spikes slender.

GAS-PLANT: *Dictamnus albus.*

GASTERIA. *Liliaceæ.* S. African succulents, stemless or nearly so, with long 2-ranked thick lvs. crowded in rosettes and red or rose fls. in loose racemes. For cult. see *Succulents;* grown as fancier's plants.

acinacifolia. Lvs. to 14 in. long and 2 in. wide, with few dots: infl. 4 ft. high, fls. to 2 in. long.

disticha: *G. lingua.*

lingua (*G. disticha*). Lvs. to 10 in. long and 2 in. wide, white spotted: infl. 3 ft. high.

maculata. Lvs. to 8 in. long and 2 in. wide, spotted or white at base: infl. 4 ft. high.

pulchra. Sts. leafy, to 1 ft. and more: lvs. to 1 ft. long and 1 in. wide, white spotted: infl. to 3 ft., branched.

sulcata. Lvs. to 4 in. long and 1 in. wide, with small greenish dots: infl. to 2½ ft.

verrucosa. Lvs. to 6 in. long and ¾ in. wide, the surface roughened by many white tubercles: infl. 2 ft. high.

GASTONIA: *Trevesia palmata.*

GASTROCHILUS. *Orchidaceæ.* Epiphytes with short leafy sts. and fls. in many-fld. racemes, the sepals and petals similar, the lip toothed or fringed and with sac-like base. For cult. see *Orchids.*

bellinus (*Saccolabium bellinum*). Lvs. to 8 in. long and 1 in. wide: fls. 1½ in. across, in 4–7-fld. racemes; sepals and petals greenish-yellow spotted with purple; lip white spotted with red, Feb.–Mar. Burma.

GAULTHERIA. *Ericaceæ.* Evergreen little shrubs or herb-like, adapted to the rock-garden, having alternate or sometimes opposite lvs., urn- or bell-shaped fls., and bright colored berry-like capsular frs.; an aromatic oil is derived from several species.

Moist sandy or peaty soils and partial shade are desirable. Propagated by seeds, layers, suckers, division, and by cuttings of half-ripened wood.

Miqueliana. Woody evergreen to 1 ft.: lvs. elliptic to obovate, crenate-serrate: fls. white or pinkish, nodding, less than ¼ in. long: fr. white. Japan.

oppositifolia. To 8 ft., much branched: lvs. opposite, ovate or oblong-ovate, to 2½ in. long, cordate at base, leathery: fls. white, ⅙ in. long, in mostly panicled racemes. New Zeal.

procumbens. WINTERGREEN. CHECKERBERRY. TEABERRY. Sts. creeping: lvs. oval, to 2 in. long, shining above: fls. white, ¼ in. long, solitary and nodding, May–Sept.: fr. scarlet. Newf. to Man. and Ga.

rupestris. To 4 ft., much branched, rarely prostrate: lvs. variable, oblong to ovate, to 2 in. long, leathery: fls. white, in racemes. New Zeal.

Shallon. SALAL. To 2 ft.: lvs. ovate, to 5 in. long: fls. white or pink, ⅖ in. long, in panicled racemes, May–June: fr. purple turning black. Alaska to Calif.

GAURA. *Onagraceæ.* Several N. American herbs with alternate simple lvs., small white or rose fls. in spikes or racemes, and nut-like caps.; sometimes grown in the wild-garden or hardy border. Propagated by seeds and division.

coccinea. Per. to 2 ft.: lvs. oblong or lanceolate, to 1½ in. long: fls. pink, white or scarlet, ½ in. long. S. D. to Mex.

Lindheimeri. Per. to 4 ft.: lvs. lanceolate, to 3½ in. long: fls. white, ¾ in. long, in loose terminal spikes. La., Tex.

GAUSSIA. *Palmaceæ.* Two monœcious unarmed tall feather-palms of Cuba and Porto Rico, both intro. in S. Fla.: trunk enlarged at base, tapering above: spadices in the axils of lower lvs., branched, becoming spreading or deflexed; fls. in 2's to 5's on the branches, the lowest commonly pistillate; stamens 6: fr. obovoid-oblong, small. See *Palm* for cult.

attenuata (*Aeria attenuata*). LLUME PALM. To 80 ft. and more, slender above; the roots produce spine-like protrusions: lvs. 3–4 ft. long; pinnæ many, close together, 12–16 in. long and about 1 in. broad, acute: fr. orange-red, about ⅝ in. long. Porto Rico, on limestone hills and ridges.

princeps (*G. splendens*). Less tall: pinnæ almost horizontal but pointing in different directions, with cushion-like swelling at base: fr. about ½ in. or less long. Limestone mts. and cliffs, W. Cuba, making long aerial roots.

splendens: *G. princeps.*

GAYA. *Malvaceæ.* Herbs, shrubs or rarely trees, having alternate simple lvs., yellow or white axillary or terminal fls., and fr. of many carpels; native in S. Amer. and one in New Zeal., the latter planted in S. Calif.

Lyallii (*Plagianthus Lyallii*). LACEBARK. Deciduous tree to 30 ft., pubescent: lvs. ovate, to 4 in. long, deeply crenate: fls. white, to 1 in. across, in clusters of 3–5 or rarely solitary. New Zeal. Var. ribifolia has deeply lobed or cut lvs.

GAYFEATHER: *Liatris.*

GAYLUSSACIA. HUCKLEBERRY. *Ericaceæ;* separated by some authors in *Vacciniaceæ.* American shrubs with alternate usually entire lvs., white or reddish fls. in axillary racemes in spring, and fr. a blue or black berry-like drupe crowned by the persistent calyx-lobes; distinguished from Vaccinium by the 10-celled ovary instead of usually 4–5-celled in the latter.

Huckleberries should have shady locations in peaty or sandy soil. They do not thrive on limestone lands. Propagated by seeds, layers, division, and the evergreen sorts by cuttings of half-ripe wood under glass.

baccata (*G. resinosa*). BLACK H. To 3 ft., deciduous, the branches sticky when young: lvs. to 2 in. long: fls. reddish, ovoid, in dense drooping racemes to 1 in. long: fr. black, shining. Newf. to Ga.

brachycera. BOX H. To 1½ ft., the st. creeping, evergreen: lvs. to 1 in. long: fls. white or pink, cylindrical, in short racemes: fr. blue. Pa. to Va.

dumosa. To 1½ ft., the st. creeping and glandular-pubescent, deciduous: lvs. to 2 in. long: fls. white, pink or red, bell-shaped, in loose racemes: fr. black. Newf. to Fla. and La.

frondosa. DANGLEBERRY. To 6 ft., deciduous: lvs. to 2¼ in. long: fls. greenish-purple, bell-shaped, in racemes to 3 in. long: fr. blue, bloomy. N. H. to Fla.

resinosa: *G. baccata.*

ursina. BUCKBERRY. To 6 ft.: lvs. to 4 in. long: fls. whitish or reddish, bell-shaped, in racemes to 2 in. long: fr. black, shining. N. C., S. C.

GAZANIA (*Meridiana*). *Compositæ.* Herbaceous perennials, seldom annuals, with entire or pinnately cut lvs. and solitary heads on long sts.; ray-fls. white, yellow, orange, scarlet, opening in sunshine, closing at night; disk-fls. dark; pappus of scales; native in S. Afr.

Gazanias are grown in the flower-garden and for edgings. Propagated by seeds, division and also by cuttings taken in summer from shoots near the crown of the plants. The kinds in cultivation are not clearly understood.

longiscapa. Stemless: lvs. white-woolly below, lanceolate or pinnately cut: heads large, on glabrous peduncles longer than lvs., rays orange with dark spot at base.

rigens. Sts. short and branching, densely leafy or diffuse: lvs. white-woolly below, spatulate or occasionally pinnatifid: heads 1½ in. across, on glabrous peduncles longer than lvs., rays orange with a brown-black white-eyed spot at base, varying to yellow, blooming throughout the year in warm climates.

splendens. Supposed hybrid: to 1½ ft.: lvs. silky white beneath, linear-spatulate: heads large, rays orange with black and white spot at base.

GEIGER-TREE: *Cordia Sebestena.*

GEITONOPLESIUM. *Liliaceæ.* Somewhat woody twining shrubs, of 1 or 2 species in Australia and Pacific Isls., grown in Calif.: segms. of perianth 6, oblong, distinct, outer ones often hooded.

cymosum. Lvs. alternate, linear to ovate, to 3 in. long: fls. purplish-green, ⅓ in. long, drooping, in loose terminal cymes: fr. a dark blue berry ½ in. across.

GELSEMIUM. *Loganiaceæ.* Twining shrubs with commonly opposite entire lvs., fragrant funnelform fls. solitary or in small cymes, and capsular frs.; grown in the S. as a cover for porches and banks and sometimes under glass. Propagated by cuttings under glass and by seeds. One species in E. Asia and 2 in E. N. Amer.

sempervirens. CAROLINA YELLOW JESSAMINE. Evergreen: lvs. lanceolate, to 4 in. long, shining above, narrowed at base: fls. bright yellow, to 1½ in. long, blooming throughout the season, borne on scaly pedicels; calyx-lobes obtuse: fr. ¾ in. or more long, short-beaked. Va. to Fla., Tex. and Cent. Amer.—A second species, *G. Rankinii*, has recently been distinguished, N. C. to Fla. and Ala., marked by lvs. rounded at base, pedicels scaly only on lower part, calyx-lobes narrow and acuminate, fr. about ½ in. long and long-beaked.

GEMMINGIA: *Belamcanda chinensis.*

GENIOSTOMA. *Loganiaceæ.* Shrubs ranging from Madagascar to Pacific Isls., with opposite lvs., small fls. in axillary clusters or cymes, and capsular frs.; one species grown in Calif.

ligustrifolium. To 12 ft., glabrous: lvs. ovate, to 3 in. long, entire, paler beneath: fls. greenish-white, ⅙ in. across. New Zeal.

GENIP: *Genipa americana, Melicocca bijuga.*

GENIPA. GENIP (see also *Melicocca*). *Rubiaceæ.* Trop. American trees with large opposite lvs., white or yellowish large fls. in cymes, the corolla salverform with 5–6 lobes, and fr. a berry which is eaten fresh, made into preserves or drinks in its native lands.

Genipa can be grown only in the tropics without protection or risk, and grows best in rich loam with abundant moisture. Propagated by seeds and by shield-budding.

americana. To 50 ft.: lvs. obovate to oblong, to 1 ft. long: fls. white or pale yellow, 1 in. across, silky: fr. brown, to 3 in. across. Trop. Amer. where it is called "Marmalade-Box" and "Genipap."

GENIPAP: *Genipa americana.*

GENISTA. BROOM. *Leguminosæ.* Ornamental shrubs with simple or trifoliolate lvs., papilionaceous yellow or white fls. in racemes, and flattened pods; they differ from Cytisus in technical characters.

Brooms are adapted to dry situations and mild climates. Propagated by seeds, layers, and greenwood cuttings under glass. The Genista of florists is *Cytisus canariensis.*

æthnensis. To 20 ft., the branches almost leafless: fls. golden-yellow, fragrant, axillary along the branches, July–Aug. Sicily, Sardinia.

alba: *Cytisus albus.*

Andreana: *Cytisus scoparius* var. *Andreanus.*

anglica. To 3 ft., sometimes procumbent, spiny: fls. in few-fld. racemes. Eu.

canariensis: *Cytisus canariensis.*

capitata: *Cytisus supinus.*

cinerea. To 3 ft.: fls. bright yellow, in terminal racemes to 8 in. long, Apr.–June. S. Eu., N. Afr.

dalmatica: *G. silvestris* var *pungens.*

elegans: hort. name.

florida. To 5 ft., branches striped: fls. yellow, in dense many-fld. racemes, Apr.–July. Spain.

fragrans: *Cytisus fragrans.*

hispanica. SPANISH B. To 2 ft., the branches spiny: fls. golden-yellow, in terminal heads or clusters, in May–June. S. W. Eu. Var. **nana** is a dwarf form.

juncea: *Spartium junceum.*

maderensis: *Cytisus maderensis.*

monosperma. To 10 ft., almost leafless: fls. white, fragrant, in short lateral racemes, in early spring. Spain, N. Afr. Hort. forms are **alba** and **pendula.**

multiflora: *Cytisus multiflorus.*

ovata. To 4 ft., hairy, the branches striped: fls. yellow, in short racemes. E. Eu.

palmensis: *Cytisus filipes.*

pilosa. Prostrate: fls. yellow, in short racemes, May–July. Eu.

præcox: *Cytisus præcox.*

prostrata: *Cytisus decumbens.*

racemosa: *Cytisus racemosus.*

radiata. To 2 ft., much branched: fls. yellow, in 3–10-fld. heads, May–July. S. Eu.

sagittalis. To 1 ft., the branches broadly 2-winged: fls. yellow, in terminal racemes, June–July. Eu., W. Asia.

scoparia: *Cytisus scoparius.*

sessilifolia: *Cytisus sessilifolius.*

sibirica: *G. tinctoria.*

silvestris. Spiny: fls. in racemes to 4 in. long. S. E. Eu. Var. **pungens** (*G. dalmatica*) is more spiny.

stenopetala: *Cytisus maderensis* var. *magnifoliosus.*

sulphurea: listed name.

tinctoria (*G. sibirica*). Dyers-Greenweed. To 3 ft., the branches striped: fls. yellow, in many-fld. racemes panicled at the ends of the branches, in summer. Eu., W. Asia; nat. in N. Amer.

Veitchii fragrans: hort. name.

GENTIAN: *Gentiana.* **Horse:** *Triosteum.* **Prairie:** *Eustoma Russellianum.*

GENTIANA. Gentian. *Gentianaceæ.* Per. and ann. herbs with mostly opposite, simple and entire lvs. and blue or purple, rarely yellow or white fls.; corolla 4–5-lobed and with plaits, teeth or appendages in the sinuses.

Gentians are grown mostly as rock-garden subjects and not common in gardens in this country. They require good drainage with plenty of moisture and a cool temperature, as the planted kinds are mostly mountain or alpine plants. Some species require special treatment, determined by personal experience, and are grown only by fanciers. Propagated by seed sown as soon as ripe and which are small and slow in germinating. The genus abounds in good blues. Some of the plants known as gentians may be Centaurium.

acaulis (*G. excisa*). Stemless G. Per. to 4 in.: lvs. elliptic or lanceolate: fls. solitary, dark blue spotted inside, 2 in. long. Alps and Pyrenees.—By some authors divided into several species.

alba: *G. flavida.*

Andrewsii (*Dasystephana Andrewsii*). Closed G. Per. to 2 ft.: lvs. ovate to lanceolate: fls. purplish-blue, nearly or quite closed, 1½ in. long, in terminal sessile clusters or in upper axils. E. N. Amer.

angulosa: *G. verna* var. *alata.*

angustifolia. Per., stoloniferous: lvs. linear-oblong: fls. blue spotted with green. Alps.

asclepiadea. Per. to 1½ ft.: lvs. ovate-lanceolate: fls. dark blue, 1½ in. long, solitary in the axils and resembling leafy racemes. S. Eu., Caucasus. Var. **alba** has white fls.

bavarica. Per. to 3 in.: lvs. ovate: fls. solitary, deep blue, 1 in. long. Cent. Eu.

Bigelovii (*Dasystephana Bigelovii*). Per. to 1 ft.: lvs. oblong to linear: fls. purple, 1 in. long, solitary in axils and forming a many-fld. spike. Colo. to Ariz.

Burseri. Per. to 1 ft.: lvs. elliptic-ovate: fls. yellowish, calyx spathe-like. Pyrenees.

calycosa (*Dasystephana calycosa*). Per. to 1 ft.: lvs. ovate: fls. dark blue spotted with green, to 1½ in. long, solitary. B. C. to Mont. and Calif.

campestris. Ann. to 6 in.: lvs. ovate-lanceolate, to 1¼ in. long, entire, sessile: fls. bright purple, erect, 1 in. and more long, in abundance. Eu.—Good for the rock-garden.

Clusii. One of the segregates from *G. acaulis* but scarcely differing.

crinita. Fringed G. Bien. to 3 ft., with long slender roots that are broken in ordinary transplanting: lvs. obovate to lanceolate: fls. solitary, bright blue, 2 in. long, the lobes conspicuously fringed. E. N. Amer.

cruciata. Per. to 10 in.: lvs. ovate-lanceolate: fls. dark blue, ¾ in. long, in axillary clusters. Eu., N. Asia.

dahurica: *G. Olivieri.*

decumbens. Per. to 10 in.: lvs. oblong or elliptic: fls. blue, about 1 in. long, in clusters, calyx spathe-like. Himalayas.

depressa. Per. to 2 in.: lvs. elliptic: fls. solitary, blue, 1¼ in. long. Himalayas.

detonsa. Per. to 2 ft.: lvs. oblong: fls. blue, ¾ in. long, in terminal and axillary clusters. Himalayas.

elegans: *G. thermalis.*

excisa: *G. acaulis.*

Farreri. Per., stoloniferous, the sts. ascending: lvs. linear, the pairs connate at base: fls. solitary, blue with white throat and yellowish-white band on the petals, to 2½ in. long. China.

Fetisowi. Tall per.: lvs. lanceolate: fls. deep blue, 1½ in. long, in terminal and axillary clusters. China.

flavida (*G. alba. Dasystephana flavida*). Per. to 3 ft.: lvs. ovate-lanceolate: fls. greenish or yellowish-white, to 2 in. long, in clusters. Ont. to Va. and Mo.

Freyniana. A hort. form of *G. septemfida* with larger less fringed fls.

frigida. Per. to 6 in.: lvs. spatulate-linear: fls. whitish, few together. Carpathian Mts.

gelida. Per. to 6 in.: lvs. ovate-lanceolate: fls. yellowish-white, in clusters. Caucasus.

Kesselringi. Per. to 8 in.: lvs. lanceolate: fls. whitish dotted violet outside, in terminal clusters. Turkestan.

Kurroo. Tufted per. to 7 in.: lvs. lanceolate to linear: fls. blue spotted with white inside, 1–3 together. Himalayas.

Lagodechiana. Listed as a dwarf or creeping plant with large pale blue fls.

linearis (*Dasystephana linearis*). Per. to 2 ft.: lvs. linear or linear-lanceolate: fls. blue, to 2 in. long, in terminal clusters. N. B. to Md. and Minn.

lutea. Per. to 6 ft.: lvs. ovate: fls. yellow, 1 in. long, in dense umbel-like cymes, calyx spathe-like. Eu., Asia Minor.

macrophylla. Per. to 1 ft.: lvs. lanceolate, to 1 ft. long: fls. pale blue, in terminal clusters. Siberia.

Menziesii. Slender, to 15 in., ascending: lvs. narrow-oblong to lanceolate, to 1½ in. long: fls. blue, 1 in. long, 1 or 2 at an insertion. Calif., Ore.

nivalis. Ann. to 4 in.: fls. solitary, blue, ⅔ in. long. Eu.

Olivieri (*G. dahurica*). Lvs. narrowly lanceolate: fls. dark blue, in umbel-like cymes. Asia.

Parryi (*Dasystephana Parryi*). Per. to 16 in.: lvs. linear-lanceolate to ovate: fls. bright blue, about 2 in. long, 1–6 together. Wyo. to Utah.

phlogifolia. Per. to 10 in.: lvs. lanceolate-oblong: fls. blue, in terminal 3–7-fld. cymes. E. Eu.

Pneumonanthe. Per. to 1 ft.: lvs. oblong-lanceolate to linear: fls. deep blue lined outside with green, 1½ in. long, in the axils of upper lvs. forming a raceme-like cyme. Eu., N. Asia.

Porphyrio (*Dasystephana Porphyrio*). Per. to 1½ ft.: lvs. linear: fls. bright blue often spotted with brown, 2 in. long, solitary and terminal. Pine barrens, N. J. to Fla.

Przewalskii. A few in. high: lvs. oblong to oblong-linear: fls. blue with cream-colored anthers, to 2½ in. long, in terminal clusters of 1–3. China.

puberula (*Dasystephana puberula*). Per. to 1½ ft.: lvs. lanceolate: fls. blue, 1½ in. long, sessile in upper axils and forming a dense spike. Ohio to Sask.

Purdomi: listed name.

Saponaria (*Dasystephana Saponaria*). Per. to 2½ ft.: lvs. lanceolate or oblong: fls. blue, 2 in. long, in terminal and axillary clusters. Ont. to Fla. and La.

scabra. Lvs. ovate, rough-toothed: fls. dark blue, in clusters. E. Asia. Var. **Buergeri** is a form with narrower fls.

sceptrum. Per. to 4 ft.: lvs. oblong-lanceolate: fls. dark blue often dotted with greenish, 1 in. long, in clusters. B. C. to Calif.

septemfida. Per. to 1½ ft.: lvs. ovate-lanceolate: fls. dark blue, to 2 in. long, in terminal clusters. Asia.

sino-ornata. Stoloniferous per. with sts. to 7 in. long: lvs. in rosettes, linear-lanceolate: fls. yellowish-white marked irregularly with purple, to 2¼ in. long, solitary and terminal. Mts., China.

straminea. Per. to 1 ft.: lvs. linear-oblong: fls. pale yellow, 2 in. long, 1 or 2 together. China.

thermalis (*G. elegans. Anthopogon thermalis*). Ann. to 1 ft.: lvs. obovate: fls. deep blue streaked with lighter, 2 in. long, solitary. Colo. to Ariz.

tibetica. Per. to 1½ ft.: lvs. lanceolate: fls. yellowish-white tinted lilac, crowded in upper axils. E. Himalayas.

verna. Tufted per. to 3 in.: lvs. ovate: fls. dark blue, solitary, 1 in. long. Eu. Var. **alata** (*G. angulosa*) is taller with winged calyx.

Walujewi. Lvs. elliptic or lanceolate: fls. whitish dotted with pale blue, crowded in a terminal cluster. Turkestan.

GENTIANACEÆ. Gentian Family. About 70 genera of herbs or rarely shrubs, of wide distribution, with mostly opposite simple and entire lvs. and regular bisexual gamopetalous fls. having 4–12 sepals, petals and stamens, superior 1-celled ovary, and capsular frs. Some of the best blues among fls. are in this family. A few genera are grown for ornament although of minor importance except for special uses, as Centauridium, Chironia, Eustoma, Exacum, Frasera, Gentiana, Menyanthes, Nymphoides.

GENUS (plural, *genera*). A more or less closely related and definable group of plants comprising one or more species, and the name of which becomes the first word of the binominal employed in horticultural and botanical literature. Thus *Citrus* is a genus comprising the citrus fruits, and some of the species are *Citrus sinensis* the sweet orange, *C. aurantifolia* the lime, *C. paradisi* the grapefruit. The oaks belong to genus *Quercus:* the white oak is *Quercus alba*, Spanish red oak *Q. rubra*, live oak *Q. virginiana*. Rosa is the genus of the roses, Pinus of the pines, Lilium of the lilies, Delphinium of larkspurs, Lycopersicon of tomatoes, Mentha of mints, Fragaria of the strawberries. In some cases the technical genus name has become also the common or vernacular name, as Begonia, Petunia, Chrysanthemum, Dahlia, Iris, Grevillea, Gladiolus, Verbena, Crinum, Magnolia, Rhododendron. By bearing in mind that the first of the two words in the Latin or botanical designation of a plant is the generic name, the gardener arrives at the first step in tracing plants in books and indices, as he must know a man's surname to find him in the directory. See *Species* and *Family*. Something like 10,000 or more genera are commonly recognized among seed-bearing or flowering plants.

GEONOMA. *Palmaceæ*. Feather-palms or feather-veined, unarmed, stoloniferous, cespitose or trunk solitary, slender but usually not very tall, the sts. ringed and commonly reed-like, monœcious or diœcious, with variable foliage and sometimes lvs. entire and bifid, when pinnatisect the pinnæ or segms. frequently with broad not petiole-like bases: spadices below the lvs. for the most part, the fls. in pits or depressions on the branches; stamens 6, connate: fr. small, globose, oblong or ellipsoid, 1-seeded, dark purple or black. Trop. Amer., perhaps 100 species, mostly woods palms. Some of the species stand in shady protected places in S. Fla., and they are grown under glass making attractive small tub specimens. See *Palm*.

elegans. Graceful palm, caudex to 6 ft. and very thin: lvs. 10–14 in number close together at apex of trunk, dark green, 1½–2½ ft. long, with broad and narrow divisions intermingled; pinnæ 3–5, broad-lanceolate, to 10 in. long, 1-nerved and with several secondary nerves, the terminal largest: spadices from the axils of lowermost lvs.: fr. oblong, dark purple, about ⅓ in. long. Brazil. Var. **robusta** is a larger plant, with more and broader pinnæ or segms., the narrow ones ⅓ in. broad and others much broader.

gracilis (*G. Riedeliana*). Slender, with single st., 4 ft., 1½ in. thick, naked: lvs. in a terminal crown, 2½ ft. long, regularly pinnate; pinnæ many, 1 ft. long and ½ in. or less broad, long-acuminate, 3-nerved, curving. Probably Brazil.—Closely allied to *G. Schottiana* and differs mostly in technical characters.

imperialis: hort. name for a palm from Colombia.

princeps. Slender but stout, 4 or 5 ft., st. naked: lvs. 2½ ft., arching, regularly pinnate but terminal pinnæ broader or confluent; pinnæ about 50, green both sides, strong 3- or more ribbed, 18–20 in. long, main ones 1 in. or less broad, long-pointed. Peru.

Pynaertiana: hort. name for a simple-lvd. Malayan palm, with light green foliage: lvs. about 28 in. long and 10 in. broad.

Riedeliana: *G. gracilis*.

Schottiana. Caudex single, 9–16 ft. and 1 in. thick more or less: lvs. long and gracefully curving, regularly pinnate; pinnæ 30–50 or more, and sharp-pointed, 10–12 in. long and about ½ in. broad, curving: fr. ellipsoidal, about ½ in. long. Brazil, in several forms.

GEOPRUMNON: *Astragalus mexicanus*.

GEORGINA: *Dahlia*.

GERANIACEÆ. Geranium Family. Herbs, sometimes semi-woody, of about 12 genera widely distributed over the world; known to cult. in the ornamental genera Erodium, Geranium and Pelargonium, and species of Erodium have forage value. The family is characterized by its bisexual mostly regular polypetalous fls., usually 5 sepals and petals and stamens 5, 10 or 15, superior 3–5-lobed ovary, and capsular fruit. The geranium tribes are of simple culture. The true geraniums and the erodiums are mostly hardy plants in the East, but pelargoniums need house treatment except in California and similarly mild climates.

GERANIUM. Cranesbill. *Geraniaceæ*. Herbs ann. or per., with palmately lobed or divided lvs., pink or purplish fls. 1–2 in the axils, having 10 stamens, 5-celled ovary with 2 ovules in each cell, and long-beaked frs.

Grown in the hardy border or rock-garden. Propagated by seeds and root-division; the cultivated perennials should be transplanted from the seed-bed in early spring. They are mostly hardy plants, and some of them are introduced weeds. See *Pelargonium*, to which the greenhouse and florists' geraniums belong.

aconitifolium. Per. to 1½ ft.: lvs. deeply 7-lobed: fls. white, ½ in. or less across. Eu.

albiflorum. Per. to 1½ ft.: lvs. deeply 7-lobed: fls. white veined with pink, about ½ in. across. S. Siberia.

anemonefolium. Per. to 1½ ft.: lvs. 5-parted: fls. pale purple. Canary Isls.

argenteum. Silver-leaved C. Per. or bien. to 5 in.: lvs. 5–7-parted, hoary and silky on both sides: fls. pink with darker veins, 1 in. across. N. Italy.

armenum: *G. psilostemon*.

carolinianum. Ann. to 1½ ft.: lvs. 5–7-parted: fls. pale pink or whitish, to ¼ in. across. N. Amer.

cinereum. Per. to 6 in.: lvs. 5–7-parted, glaucous: fls. pink with dark stripes, about 1 in. across. Pyrenees.

citriodorum: *Pelargonium acerifolium*.

collinum. Per., somewhat decumbent, to 1½ ft.: lvs. deeply 7-parted: fls. purplish-violet, the veins deeper, less than ½ in. across. E. Eu.

dissectum. Ann. to 2 ft.: lvs. 5–7-parted: fls. purple, to ¾ in. across. S. Eu.; nat. in N. and S. Amer.

Endressi. Per. to 1½ ft.: lvs. deeply 5-lobed: fls. rose, ⅓ in. across. Pyrenees.

eriostemon (*G. platyanthum*). Per. to 2 ft.: lvs. deeply 5-lobed: fls. violet-blue, 1 in. across. Siberia to China.

Fremontii. Per., 1 ft. or more high: lvs. 5–7-parted: fls. rose-purple, 1 in. across. Rocky Mts.

grandiflorum. Per. 1 ft. or more: lvs. deeply 5-lobed: fls. lilac with purple veins, to 1½ in. across. N. Asia.

gymnocaulon. Per. to 1½ ft.: lvs. 5-parted: fls. deep violet, to ¾ in. long. W. Asia.

ibericum. Per. to 1½ ft.: lvs. 7-lobed nearly to base: fls. purple, 1¼ in. long. S. W. Asia. Var. **album** has white fls.

incisum. Per. to 2 ft.: lvs. 3–5-parted, the lfts. often cut: fls. pink or purple, ½ in. long. B. C. to Calif.

lancastriense: *G. sanguineum* var. *prostratum.*

Lowii: name for a hort. form having bright rose fls. with violet center.

macrorrhizum. Per. to 1½ ft., with long thick root: lvs. 5–7-lobed nearly to base: fls. magenta. S. Eu.

maculatum. Per. to 2 ft.: lvs. deeply 3–5-lobed: fls. rose-purple, 1 in. across. N. Amer. Var. **album** has white fls.

nepalense. Per. with decumbent or ascending sts. to 1½ ft. long: lvs. deeply 5-lobed: fls. rose-purple, to ⅔ in. across. Mts. of Asia.

phæum. Per. to 2 ft.: lvs. deeply 5–7-lobed: fls. dark blue or almost black, with white spot at base of each petal. Eu.

platyanthum: *G. eriostemon.*

platypetalum. Per. to 2 ft.: lvs. 5-lobed beyond middle: fls. dark purple, ¼ in. long. China.

pratense. Per. to 3 ft.: lvs. 7-parted: fls. purple, about ½ in. across. Eurasia. Var. **album** has white fls.

prostratum: *G. sanguineum* var.

psilostemon (*G. armenum*). Per. to 2 ft.: lvs. deeply 5-lobed: fls. dark red, spotted with black at base, about 1½ in. across. Armenia.

pusillum. Prostrate much branched ann.: lvs. 5–9-parted, the lfts. 3-lobed: fls. blue-purple, ¼ in. across. Eu. to Himalayas.

Pylzowianum. Per. to 1 ft.: lvs. 5-parted, the lfts. 3-lobed: fls. purple, 1¼ in. across. China.

Richardsonii. Per. to 3 ft.: lvs. 3–5-parted: fls. white, 1 in. across. W. N. Amer.

Robertianum (*Robertiella Robertianum*). Herb-Robert. Red Robin. Ann. or bien. to 1½ ft.: lvs. 3-parted, the lfts. deeply cut: fls. red-purple, about ¼ in. long. N. Amer., Eurasia, N. Afr., mostly in woods or coppices.

sanguineum. Per. to 1½ ft., covered with spreading white hairs: lvs. 5–7-parted: fls. reddish-purple. Eurasia. Var. **album** has white fls. Var. **prostratum** (*G. lancastriense, G. prostratum*) is a dwarfer form with lighter colored fls.

sessiliflorum. Per. to 4 in.: lvs. all basal, deeply 5–7-parted: fls. white, to ½ in. across. Andes of S. Amer.

sylvaticum. Per. to 2½ ft.: lvs. deeply 7-lobed: fls. violet, about 1 in. across. Eu., Asia.

Traversii. Per. to 1½ ft., gray-pubescent: lvs. 7-parted to about the middle: fls. rose or white, 1 in. across. Chatham Isl. (New Zeal.)

Wallichianum. Prostrate per.: lvs. 3–5-parted, the lfts. deeply toothed: fls. purple, to 2 in. across. Himalayas.

Wilfordi. Procumbent ann.: lvs. 3-parted, the lfts. deeply toothed: fls. white striped with rose, ½ in. across. Manchuria.

Willardi. Per. to 1½ ft.: fls. rosy-red. Botanical position unknown.

GERANIUM, BEEFSTEAK-: *Begonia Rex-cultorum.* **California-:** *Senecio Petasitis.* **Feather-:** *Chenopodium Botrys.* **Florists:** *Pelargonium.* **Mint-:** *Chrysanthemum Balsamita.* **Strawberry-:** *Saxifraga sarmentosa.*

GERARDIA: *Aureolaria pedicularia;* other Gerardias belong in Agalinis but apparently not in cult.

GERBERIA (*Perdicium*). *Compositæ.* Herbaceous perennials with lvs. in basal tufts, the solitary pink, yellow or orange heads on scapes, with 1 or 2 rows of ray-fls.; pappus of bristles; native in S. Afr. and Asia.—Name commonly but not originally spelled *Gerbera.*

Gerbera is grown in a temperate greenhouse and out-of-doors in mild or protected places. It may survive the northern winters if given a protection of leaves and decomposed manure. Propagated by seeds or by cuttings of side shoots.

anandria. Differing from *G. Kunzeana* in the woolly involucral bracts and pale pappus. China.

Jamesoni. Transvaal Daisy. Barberton Daisy. To 1½ ft., hairy: lvs. very woolly beneath, to 10 in. long, pinnately lobed or parted: heads orange-flame color, to 4 in. across. Transvaal. Var. **hybrida** is listed as an improved form with white, pink, orange, salmon, ruby-red-violet fls.—Not hardy in northernmost states; sometimes bloomed under glass.

Kunzeana. Diœcious: lvs. oblong or ovate, lobed or lyrate-pinnatifid, very woolly beneath: bracts of involucre glabrous; pappus brown. Himalayas.

GERMANDER: *Teucrium.*

GESNERIA: see *Corytholoma cardinalis, Nægelia.*

GESNERIACEÆ. Gesneria Family. Mostly trop. herbs, rarely shrubs or trees, of about 84 genera, having simple lvs. which are frequently colored above or underneath, tubular usually 5-lobed showy gamopetalous often irregular corolla, 4 stamens, superior or inferior ovary, and commonly fleshy frs. Plants of several genera are grown for ornament chiefly under glass, as Achimenes, Alloplectus, Columnea, Conandron, Corytholoma, Episcia, Haberlea, Isoloma, Mitraria, Nægelia, Ramondia, Rhabdothamnus, Saintpaulia, Sinningia, Streptocarpus, Trichosporum, Tussacia.

GESNOUINIA. *Urticaceæ.* Canary Isl. shrubs or trees with alternate entire lvs. and unisexual fls. borne 3 together in an involucre in spikes or panicles; sometimes grown in the open in S. Calif. for ornament and interest. Propagated by cuttings.

arborea (*Parietaria arborea*). Tree to 20 ft.: lvs. lanceolate, to 5 in. long and 2 in. wide, white-tomentose beneath: fls. in large terminal panicles.

GEUM. Avens. *Rosaceæ.* Per. erect herbs often with runners, with pinnate basal lvs. and small st.-lvs., yellow, white or red fls. in corymbs or solitary, and fr. an achene with long persistent style; native in temp. and cold regions and adapted to rock-gardens, and the taller ones for rear borders; some of them are good flower-garden subjects. Of easy cult. Propagated by seeds and by division.

atroccccineum: probably *G. chiloense.*

atrosanguineum: *G. chiloense.*

Borisii. Hybrid between *G. reptans* and *G. bulgaricum:* fls. bright yellow.

bulgaricum. To 2 ft.: lvs. with very large heart-shaped terminal lft. and numerous small lateral lfts.: fls. nodding, bright yellow or orange. Bulgaria.

canadense. To 2½ ft.: lvs. 3–5-parted into toothed or lobed lfts.: fls. white, about ½ in. across. N. S. to La.

chiloense (*G. atrosanguineum*). To 2 ft.: lvs. with large terminal toothed lft. and many smaller lateral lfts., hairy: fls. scarlet, to 1½ in. across. Chile. Var. **plenum** has double fls. A favorite garden form is Mrs. Bradshaw.

ciliatum (*G. triflorum. Sieversia ciliata*). To 1½ ft.: lvs. of numerous lfts. deeply cut into linear-lanceolate silky-ciliate segms.: fls. purplish, to ¾ in. across. N. Amer.

coccineum. Lvs. with large heart-shaped terminal lft. and smaller lobed lateral lfts.: fls. bright red, 1 in. across. S. Eu., Asia Minor.—The plants commonly grown under this name are *G. chiloense.*

Eweni: hort. name for a form with light orange fls.

Heldreichii: hort. name for a form with orange-red fls: 8 in. Said to be a form of *G. montanum.*

japonicum. To 3 ft.: lvs. with a large heart-shaped 3–5-lobed terminal lft. and small lateral lfts.: fls. yellow. Japan.

Kolbianum: listed as a plant with deep orange-red fls.; said to be a hybrid.

macrophyllum. To 3 ft.: lvs. with large 3–7-lobed terminal lft. and 3–6 main lateral lfts.: fls. yellow, to ¾ in. across. N. Amer., N. Eu.

montanum (*Sieversia montana*). To 1 ft.: lvs. with large terminal heart-shaped lft. and much smaller lateral lfts.: fls. golden-yellow, to 1½ in. across. S. Eu.

Peckii (*Sieversia Peckii*). To 2 ft.: lvs. with large orbicular toothed terminal lft. and few or no lateral lfts.: fls. yellow, to 1 in. across. Me., N. H.

pyrenaicum. To 1½ ft.: lvs. with large heart-shaped toothed terminal lft. and smaller lateral lfts.: fls. yellow, nodding. Pyrenees.

reptans (*Sieversia reptans*). To 6 in., with long runners: lvs. with large 3-lobed deeply toothed lft. and small lateral lfts.: fls. yellow, to 1½ in. across. Eu.

rivale. To 3 ft.: lvs. with terminal and 2 upper lateral lfts. much larger, toothed and lobed: fls. purplish, nodding, to 1 in. across. N. Amer., N. Eu., Asia.

Rossii (*Sieversia Rossii*). To 7 in.: radical lvs. interrupted-pinnate and glabrous, the lfts. 3-lobed: fls. yellow, 1 to a st. Arctic regions.

sibricum: hort. name: fls. bright red, coppery: to 10 in.

strictum. To 5 ft.: lvs. with larger terminal lft. and 4–6 lateral lfts.: fls. yellow, to ¾ in. across. N. Amer., N. Asia.

tirolense: reported as a hybrid.

triflorum: *G. ciliatum.*

urbanum. To 2 ft.: lvs. with coarsely toothed often 3-parted lfts.: fls. yellow, about ½ in. across. Eu., Asia.

GEVUINA (also but not originally spelled *Guevina*). *Proteaceæ.* One evergreen tree native in Chile and occasionally grown in S. Calif. **G. Avellana.** Chilean Nut. Chile Hazel. To 40 ft.: lvs. alternate, odd-pinnate, shining: fls. white, in axillary racemes: fr. coral-red, about size of cherry, the seed with edible kernel.—Propagated by seeds or cuttings of green wood under glass.

GHERKIN: *Cucumis.*

GILIA. *Polemoniaceæ.* Herbs with alternate entire or divided lvs. and blue, yellow, pink or white funnelform or salverform fls.; grown in the flower-garden, mostly annuals. Of easy cult. Seeds are sown where plants are to grow, in sunny open places.

abrotanifolia. Ann. to 2 ft.: lvs. 3-pinnately dissected into very narrow segms.: fls. pale blue, in dense terminal clusters. Calif.

achilleæfolia. Ann. to 2 ft., glandular-pubescent: lvs. 2-pinnately dissected into linear segms.: fls. blue, in dense terminal clusters. Calif.

aggregata. Per. or bien. to 2½ ft.: lvs. 1–2-pinnately dissected into linear segms.: fls. scarlet varying to white, in a long thyrse. W. N. Amer.

androsacea: *Linanthus androsaceus.*

californica: *Leptodactylon californicum.*

capitata. Ann. to 2½ ft.: lvs. 2–3-pinnately dissected into linear segms.: fls. light blue, in heads about 1 in. across at end of naked peduncles. Wash. to Calif.

coccinea: *Collomia biflora.*

coronopifolia: *G. rubra.*

densiflora: *Linanthus grandiflorus.*

densifolia (*Hugelia densifolia*). Per. to 2 ft., woolly-tomentose when young: lvs. linear and rigid, entire or lobed: fls. deep blue, in dense clusters. Calif.

dianthoides: *Linanthus dianthiflorus.*

grandiflora: *Collomia grandiflora.*

laciniata. Ann. to 8 in.: lvs. 2-pinnately dissected into linear segms.: fls. rose, blue, pale lilac to white, in few-fld. clusters. Peru, Chile, Argentina.

linearis: *Collomia linearis.*

liniflora: *Linanthus liniflorus.*

micrantha: *Linanthus parviflorus.*

multicaulis. To 1½ ft., branching from base: lvs. pinnately parted into linear segms.: fls. blue or pinkish, in few-fld. clusters. Calif.

nivalis: a white-fld. form of *G. tricolor.*

pulchella. Per. to 2 ft.: lvs. pinnately dissected into linear segms.: fls. crimson to white, in a narrow panicle. Mont. to Wash.

rigidula. Per. to 1 ft.: lvs. pinnately divided into linear rigid segms.: fls. blue, rotate, scattered. Tex. to Mex.

rubra (*G. coronopifolia. Ipomopsis auarantiaca, elegans* and *sanguinea*). Standing-Cypress. Bien. or per. to 6 ft.: lvs. pinnately dissected into needle-like segms.: fls. scarlet, yellow dotted with red inside, in a narrow terminal panicle. S. C. to Fla. and Tex.

squarrosa: *Navarretia squarrosa.*

tricolor. Birds-Eyes. Ann. to 2½ ft.: lvs. 2-pinnately dissected into linear segms.: fls. with lilac or violet lobes, yellowish tube and throat marked with purple, borne in loose clusters. Calif. Var. rosea has rose fls.

GILIBERTIA. *Araliaceæ.* Shrubs or trees with simple, entire or 3-lobed lvs., small fls. in umbels, and berry-like frs.; grown under glass or in the open far S. For cult. see *Polyscias.*

japonica (*Dendropanax japonicum*). Lvs. entire or 3-lobed, about 3 in. long: fls. in umbels about 1 in. across. Japan.—Planted in Calif.

GILLENIA (*Porteranthus*). *Rosaceæ.* Two N. American per. erect branching herbs with 3-lobed or -parted lvs. and white or pinkish long-stalked fls. in terminal panicles; grown in the wild- or about rock-gardens and of easy cult. Propagated by seeds and by division.

stipulata. American Ipecac. To 4 ft.: lfts. cut-lobed, the stipules broad and leaf-like: fls. to ½ in. across. N. Y. to Ga. and La.

trifoliata. Indian Physic. Similar to preceding but lfts. toothed and stipules small and awl-shaped. Ont. to Ga. and Mo.

GILLIFLOWER: *Mathiola incana.*

GILL-OVER-THE-GROUND: *Nepeta hederacea.*

GINANNIA: *Notholcus.*

GINGER: *Zingiber.* **Wild:** *Asarum.*

GINKGO. *Ginkgoaceæ.* One deciduous resinous tree native in China, **G. biloba** (*Salisburia adiantifolia*), the Maidenhair-Tree. To 120 ft.: lvs. fan-shaped, long-stalked, cut or divided in middle: staminate fls. in catkins: frs. drupe-like, long-stalked, yellowish. Hort. forms are: **aurea** with bright yellow lvs.; **fastigiata** of pyramidal habit; **laciniata** with deeply divided lvs.; **macrophylla** with larger lvs.; **pendula** with pendulous branches; **variegata** with lvs. variegated yellow.—Grown as a street or ornamental tree, hardy N. and of easy cult. in good soil. Propagated by stratified seeds, layers, cuttings, and named vars. by grafting and budding. The pistillate tree is undesirable because of the strong-smelling frs., and propagation by cuttings rather than by seeds is, therefore, sometimes advised.

GINKGOACEÆ. Ginkgo Family. Only 1 genus of 1 species, Ginkgo, grown for ornament. The family was founded in 1897; the genus had theretofore been placed in the Coniferæ (which is now separated into Ginkgoaceæ, Taxaceæ, Pinaceæ). In geologic times the ginkgoes were widespread in several species.

GINSENG. Two woods species of Panax (which see) grown for the roots which are much prized by the Chinese for medicinal uses. The native American species is chiefly grown or gathered in the United States and Canada for export. The plants are readily raised when provided with shade and constant moisture, but in land well drained of surface water. Slat or lath sheds afford good sun protection. The soil should be fertile and deep for the production of the best roots. The plant is grown from seeds that are commonly stratified or buried about a year and then sown in beds; but a good proportion may germinate the first year if sown as soon as ripe and not allowed to become dry. Autumn or spring are proper times for transplanting to permanent quarters, where the plants may stand four or five inches apart in either direction. The root matures for market in about five years; but some of the profit in ginseng culture has come from raising seeds, which should be produced rather freely at three years and abundantly at five years and thereafter; and seedlings may be sold at one and two years old.

GIRASOLE is the plant commonly known as Jerusalem artichoke but it is not an artichoke and has nothing to do with Jerusalem: it is supposed that Jerusalem, in this relation, is a corruption of the Italian name girasole. The plant is a stout tall-growing perennial, *Helianthus tuberosus* (which see), hardy throughout the country. The "artichokes" are the subterranean potato-like tubers which are nutritious alike to man and beast. It persists and becomes a weed unless the ground is completely cleaned of tubers when the crop is harvested. Propagation is by the tubers, planted in autumn or spring. On good ground the crop needs little attention except to keep down the competing weeds. The yield is heavy and should be valuable.

GLABROUS: not hairy or pubescent or tomentose; incorrectly used in the sense of smooth (not rough).

GLADIOLUS. Gladiolus, Gladioli. *Iridaceæ.* Cormous plants of perhaps 200 species, abundant in S. Afr. and others in trop. Afr. and Medit. region, now very popular for summer and autumn bloom and also for earlier flowering under glass. Many specific names are known to be in the country, as recorded below, but the common garden or hortulan gladiolus does not now represent a single species in its original form, but a modification or probably a series of blends of a few species that were early introduced to cult. or that have proved to be specially useful for horticultural purposes. It is probable that *G. blandus*, *G. cardinalis*, *G. dracocephalus*, *G. psittacinus*, *G. purpureoauratus*, *G. oppositiflorus*, *G. Saundersii*, *G. primulinus* have mostly contributed to the origin of the common hortulan gladioli. One of the early forms, a reputed hybrid, was *G. gandavensis;* and subsequently as the complexion of the modified hortulan kinds began to assume its present character, such names as *G. hybridus*, *G. Lemoinei*, *G. Nanceianus*, *G. Childsii*, *G. Froebelii*, *G. turicensis* and *G. princeps* were current but they are of little interest to contemporaneous growers. The kinds of hortulan gladioli are numerous now and of great excellence, the merits residing particularly in the shape of the flower, its size and color and markings, substance, season, keeping qualities, size and character of spike. With the exception of *G. primulinus*, in various degrees of modification, one does not now recognize straight botanical species in the common garden gladioli. In recent years many species have been intro. from Afr. by seeds. This important group of plants is represented in the American Gladiolus Society.

The flower of the gladiolus is borne from a green spathe of two leaves or valves. The perianth has 6 colored parts all united below into a tube which is mostly curved; the 3 upper parts or segments are larger than the 3 lower and often arched or hooked over them. The stamens are 3, attached deep in the tube, and the anthers are long and slender. Stigmas are 3. The ovary is inferior, 3-celled, ripening into a 3-valved many-seeded capsule.

Gladioli are tender and should be grown between the spring and autumn frosts, although the corms often persist even in northern states if well protected with ground covering. Open sunny exposure is best. Strong corms set in good earth the first of May yield plants that should begin to bloom by late July or the first of August. The ground should be well prepared and have good drainage. The use of stable manure the year previous should produce good results, but it should not be applied with the corms. The corms are planted as soon as the ground becomes warm, or in succession for later bloom, 3 to 6 inches deep; the greater depth is advisable only on warm open land and with strong corms; the plants usually stand up better with the deeper planting. For strong specimen spikes the plants may go 5 to 8 inches apart, but for mass effects they may be grown twice as thick. Planted 5 inches deep and 3 to 5 inches apart, the plants probably will not require staking. If considerable quantities are to be grown, the plants may be in rows that are wide enough apart to allow of easy tillage by hand or horse.

Before freezing weather the plants are lifted, the tops are removed, and the corms are stored in a cool dry place until spring. See that the corms are firm, clean and dry and well cured before being put away.

Named varieties or particular colors are propagated by means of the cormlets that form around the old corms or bulbs. The cormlets are planted in drills in spring, taken up in autumn and stored as are the regular flowering corms. In the second or third year the plants should bloom. New varieties or strains are grown from seeds, which are sown and plants handled as are the cormlets.

The gladiolus is well adapted to use as cut-flowers. The flowers open in the morning, and then the spike may be cut before it has bloomed much, with a long stem. Remove the old flowers. Provide fresh cool water daily, cut off a little of the stem end, and all the buds on the spike will open.

alatus. Little plant, to 1 ft. or less: lvs. linear and rigid, basal or 2 or 3 on st.: fls. 3–5, dark red and pink, segms. very unequal, lower segms. green and pink, upper segm. to 1½ in. long. S. Afr.

angustus. Sts. simple, 2–3 ft.: lvs. linear, to 2 ft. long and ¼ in. or less broad: fls. 2–6, long-tubed, white, 3 lower segms. purple-marked. S. Afr.

blandus. Sts. to 2 ft. long, sometimes branched: lvs. about 4, to 1 ft. long and ¾ in. wide: fls. 4–8, white and red-tinged, sometimes pure white and sometimes pink, segms. acute, upper one ¾ in. broad and others narrower. S. Afr.

callistus. Stout, to 3 ft. and more; allied to *G. blandus*, but differs in greater size, more robust branched infl., 3 upper segms. blotched at throat, anthers declined and violet: lvs. plane, glabrous, ensiform: perianth-tube somewhat curved, segms. white with pale rose tint, the 3 upper ones with red spots. Cape Province.

cardinalis. Sts. to 4 ft. long: lvs. 2–3 ft., glaucous-green: fls. 5–10 or more, bright scarlet and crimson, upper segm. largest and hood-shaped, lower ones white-blotched. S. Afr., sometimes hanging from cliffs.—Early intro. to cult. and supposed to be one of the parents of *G. gandavensis*.

Colvillei. Rather small, very early flowering, spikes short: fls. open or flaring with pointed segms., scarlet with oblong blotches at base. Hybrid *G. tristis* var. *concolor* with pollen of *G. cardinalis*, one of the earliest garden forms. Var. **albus**, The Bride, has white fls. This old strain is still in cult.; hardy in the middle S. There are several forms of it.

communis. St. to 2½ ft.: lvs. 3 or 4, about 1 ft. or less long: fls. 4–8, about 1½ in. long, narrow, bright purple, segms. nearly equal in length, anther shorter than filament. France, Germany; hardy in middle sections.

Cooperi. Much like *G. psittacinus*, but perianth-tube longer and segms. more acute. S. Afr.

cuspidatus. St. simple, 2–3 ft.: lvs. 3 or 4, linear and rigid, to 2 ft.: fls. 4–8, white or pale pink, tube 2–3 in. long and segms. shorter, 3 lower segms. purple-blotched. S. Afr.

Davisoniæ. Lvs. sword-shaped or linear-lanceolate, sparingly minutely pubescent, 10–12 in. long and to ½ in. or more broad, mostly basal: spike simple, to 10 in. long, 7–11-fld., the fls. nearly erect, rose-colored, the 3 inferior segms. somewhat lined and spotted and about 1 in. long. Cape Province.

debilis. Very slender, simple, to 1½ ft.: lvs. 3, with long point, one of them equalling or exceeding the st.: fls. 1–3, white, two of segms. with lilac or red spot, segms. about ¾ in. long. S. Afr.

dracocephalus. St. simple, 2 ft. or less: lvs. to 1½ ft. long and 1 in. broad: fls. few. yellowish-green and spotted dull purple, tube much curved and 2 in. or less long, upper segms. hooded and to 1 in. broad. S. Afr.

gandavensis. An old garden form that long persisted and plants of similar character are yet seen: sturdy late-blooming plant with broad lvs.: spike dense and rather long: fls. of medium size, bright red and red-yellow, streaked and pencilled, the upper segms. horizontal or hooded. Hybrid, *G. psittacinus* being stated as one parent and *G. cardinalis* the other, but *G. oppositifolius* may be involved; important foundation of much later breeding.

gracilis. St. very slender, to 2 ft.: lvs. 2–3, linear and apparently terete, rigid: fls. 2–5, fragrant, pale blue or lilac, segms. unequal, limb to 1½ in. long, the lowest longest and prominently cuspidate. S. Afr.

grandis. St. slender and terete, to 2½ ft.: lvs. 2–3, linear, strongly ribbed, to 1½ ft. long: fls. 1–5, fragrant, yellowish and tinged purplish-brown, tube to 2½ in. long and segms. shorter. S. Afr.

hirsutus. St. hairy, simple, to 2 ft.: lvs. 4–6, rigid and very strongly ribbed, short, hairy: fls. 3–6, bright red, tube 1½ in. long and segms. of similar length. S. Afr.

hortulanus. HORTULAN or GARDEN GLADIOLI. An inclusive group, for the prevailing cult. kinds of gladiolus to which no recognized botanical specific name will now apply, which cannot be included in any of the species. They are perhaps descendants more or less directly from *G. psittacinus*, variously obscured and modified. They are large strong very floriferous plants of sturdy growth, and heavy spikes of fls. in many shades and markings, but most of them with tints of lilac and violet, the upper segms. sometimes hooded and often the fl. spread wide open. There are hundreds of named vars. or seedlings.

ignescens. Much like *G. psittacinus* in fl., but with very long narrow lvs. which are 5 or 6 and nearly or quite basal: st. 2–3 ft.: spikes 2–4-fld., very open: perianth scarlet, 3 in. long, the upper segm. horizontal. Madagascar.

illyricus (*G. Reuteri*). To 1½ ft. or more: lvs. 6–10 in. long, slender, sheaths 2-edged: fls. 4–8, reddish changing to bluish, the basal segm. somewhat acute and exceeding the obtuse lower lateral segms., anthers shorter than filaments. Eu.

imbricatus. To nearly 3 ft.: lvs. 2 or 3, one of them developed into a rather broad ribbed blade about equalling st.: fls. 6–10, purple-red, opening wide, lower segms. with lighter marks, anther shorter than the filament. Eu.

inflatus. Lvs. 3, very narrow or subterete and rigid, the longest exceeding the st.: fls. 1–4, pink, the curved tube to 1 in. long, and the limb of equal or somewhat greater length, 3 upper segms. to ¾ in. broad. S. Afr.

Leichtlini. St. 2 ft.: lvs. 4, about 12 in. long and less than 1 in. broad: fls. 6–8, bright red, the 3 lower smaller segms. red at tip, then yellow, and bearing minute red spots. Transvaal.

oppositiflorus. St. 3–4 ft., sometimes branched: lvs. about 4, to 1½ ft. long and 1 in. broad: fls. many in a 2-sided spike, white, about 3 in. long, segms. acute. S. Afr.

orchidiflorus. St. mostly simple, to 1½ ft.: lvs. 3 or 4, linear, to 1 ft. long: fls. 4–6, greenish-yellow, tube ½ in. long, upper segm. hooded and 1 in. long, 3 lower ones decurved. S. Afr.

paluster (*G. triphyllus*). To 1½ ft.: lvs. about 3, lowest one rather broad, ribbed, and about equalling the st.: fls. 3–5, purple-red, with short curved tube and lower segms. rather longer, perianth not flaring, anther shorter than filament. Eu.

primulinus. St. 2–4 ft., stout: lvs. about 3, to 1½ ft. long and 1 in. broad: fls. 3–5, primrose-yellow throughout, upper segms. hooded and 2 in. long and more than 1 in. broad, 3 lower much smaller and deflexed, central upper segm. drooping like an eye-lid. Rain-forests, trop. Afr.—Now entering into horticultural kinds with notable results. See *G. Quartinianus*.

psittacinus. St. 3–4 ft.: lvs. about 4, rigid, to 2 ft. long and 2 in. broad: fls. several or many, 3 in. or more long, upper segms. hooded and dark crimson, lower much smaller mixed red and yellow. S. Afr.—Early cult.

Quartinianus. St. 2–3 ft., strong: lvs. 3 or 4, rigid, to 1½ ft. long and ¾ in. broad: fls. 6–9, blood-red to pale yellow, 3 in. or more long, upper segms. hooded, lower ones deflexed and much smaller. Trop. Afr.—*G. primulinus* is thought by some to be a color-form of this species.

recurvus. St. slender, to 2 ft.: lvs. 3, middle one 1 ft. or more long, lowest little more than a sheath: fls. 3–6, fragrant, about 3 in. long, 3 upper segms. broad and lilac, lower segms. yellow with mauve or lilac markings. S. Afr.

Reuteri: *G. illyricus*.

Saundersii. St. 2–3 ft.: lvs. 4–6, strongly ribbed, to 2 ft. long and 1 in. broad: fls. 6–8, bright scarlet with large white blotch on 3 lower shorter segms., upper segms. acute and 1 in. broad. S. Afr.

segetum. CORNFLAG. St. 2 ft. and more: lvs. 3 or 4, about 1 ft. long: fls. bright purple, open or flaring, the segms. obovate-obtuse, anther longer than filament. Medit. region; sometimes seen S.

triphyllus: *G. paluster*.

tristis. St. simple, to 2 ft.: lvs. 3, terete, to 1½ ft. long, 3–5-ribbed: fls. 3 or 4, fragrant, yellowish-white with purplish on the keels, the curved tube to 2 in. long. Var. concolor. Fls. nearly or quite white. S. Afr.

undulatus. Little plant, 1 ft. high: lvs. 4–6, to 1 ft. long and ¾ in. broad: fls. 4–6, about 3 in. long, milk-white with red keels. S. Afr.

villosus. St. simple, to 2 ft.: lvs. 3, the lower without blade, the others to 1 ft. long and linear, sheaths hairy: fls. 3 or 4, bright red or lilac, about 2 in. long. S. Afr.

Watsonius. St. very slender, to 1½ ft.: lvs. about 3, one of them with blade to 1 ft. long, the others little more than sheaths: fls. 1–4, bright red, the curved tube to 2 in. long, wide open, the segms. acute. S. Afr.

GLADWIN: *Iris fœtidissima.*

GLAND: properly a secreting part or prominence or appendage, but often used in the sense of gland-like.

GLASSWORT: *Salicornia.*

GLAUCIDIUM. *Ranunculaceæ.* A small herbaceous genus native in Japan and China, having alternate lvs., solitary fls. with 4 petal-like sepals, no petals, and numerous stamens, and fr. a follicle. One species is sometimes grown in the rock-garden.

palmatum. Per. to 2 ft. and more: lvs. palmately lobed, maple-like: fls. rich violet, large. Japan.

GLAUCIUM. HORNED-POPPY. SEA-POPPY. *Papaveraceæ.* Glaucous herbs with orange-colored juice, lobed or dissected lvs., and large yellow or red solitary fls.; grown as annuals in the flower-garden. They thrive in any garden soil in sunny locations. Propagated by seeds.

corniculatum (*G. phœniceum*). Ann. to 1½ ft.: fls. red with black spot at base of each petal: fr. bristly-hairy, linear. Eu.

flavum (*G. luteum*). Per. or bien. to 3 ft.: fls. golden-yellow or orange, 2 in. across: fr. linear, to 1 ft. long. Eu.; nat. in E. N. Amer. Var. **tricolor** has parti-colored fls.

leiocarpum. Per. to 1½ ft.: fls. yellow: fr. to 4 in. long. Medit. region.

luteum: *G. flavum.*

phœniceum: *G. corniculatum.*

tricolor: *G. flavum* var.

GLAUCOTHEA: *Erythea armata.*

GLAUCOUS: covered with a "bloom" or a whitish substance that usually rubs off. See *Pruinose.*

GLAUX. *Primulaceæ.* One succulent but not showy closely lvd. per. herb native in salt-marshes and sea-coasts of the northern hemisphere. **G. maritima.** To 1 ft., pale or glaucous: lvs. opposite, oval or oblong, to ½ in. long: fls. with purplish or white calyx and no petals, very small, solitary in the axils; sometimes planted in brackish places.

GLAZIOVA: *Syagrus.*

GLECOMA: *Nepeta hederacea.*

GLEDITSIA. HONEY LOCUST. *Leguminosæ.* Large broad-headed deciduous usually spiny trees with pinnate lvs., small greenish polygamous fls. mostly in racemes, and large flattened pods.

Honey locusts are planted as specimens and for shade; they are adapted to most soils, but *G. sinensis* and *G. horrida* are not hardy North. Propagated by seeds which should previously be soaked in hot water, or rare varieties may be grafted on *G. triacanthos.*

aquatica (*G. monosperma*). WATER or SWAMP LOCUST. To 60 ft., with simple somewhat flattened spines to 5 in. long: pods oval, 1–2 in. long, usually with 1 seed. S. C. to Fla. and Tex.

caspica. To 40 ft., very spiny: pods to 8 in. long, curved. W. Asia.

horrida (*G. japonica*). To 70 ft., with simple or branched somewhat flattened spines to 4 in. long: pods to 1 ft. long, twisted. Japan, China.

japonica: *G. horrida.*

macracantha. To 50 ft., with large spines: pods to 1 ft. long, somewhat convex. China.

monosperma: *G. aquatica.*

sinensis. To 40 ft., with conical often branched spines: pods to 7 in. long, almost straight. China.

texana. Hybrid between *G. triacanthos* and *G. aquatica*: pods to 5 in. long, straight.

triacanthos. HONEY or SWEET LOCUST. To 140 ft., with simple or 3-branched spines to 4 in. long, unarmed in var. **inermis**: pods to 1½ ft. long, becoming twisted. Pa. to Fla. and Tex. Var. **Bujoti** has drooping branchlets.

GLIRICIDIA. *Leguminosæ.* Trees and shrubs native in trop. Amer., with pinnate lvs., papilionaceous fls. in racemes, and flat pods with thickened margins; grown for ornament in warm regions and along roadsides and boundaries.

maculata: *G. sepium.*

sepium (*G. maculata*). MADRE. To 30 ft.: fls. pink, or lilac, and white, in profusion in spring before the lvs.: pods to 5 in. long. Cent. Amer., Colombia.

GLOBE-FLOWER: *Trollius europæus.*

GLOBULARIA. *Globulariaceæ.* Herbs and subshrubs with alternate lvs. and small fls. in globular heads; native mostly in the mts. of S. Eu. and Asia. Adapted to the rock-garden where they need partial shade and well-drained soil. Propagated by seed or division.

Alypum. To 2 ft., shrubby: lvs. oblong, 3-toothed at apex or entire: fls. violet-blue, the heads to ¾ in. across. S. Eu.

cordifolia. Prostrate subshrub to 4 in.: lvs. obovate or spatulate, about 1 in. long, notched only at tip: fls. blue, the heads about ½ in. across. S. Eu.

nana. Prostrate, sts. woody: lvs. club-shaped, entire, ⅙ in. or less long: fls. bluish, the heads ½ in. across. S. Eu.

nudicaulis. Per. to 10 in.: lvs. obovate, to 3 in. long, entire: fls. blue, the heads to ¾ in. across. S. Eu.

trichosantha. GLOBE-DAISY. Per. to 8 in.: lvs. spatulate, to 1 in. long, finely toothed: fls. blue, the heads about ½ in. across. Asia Minor.

vulgaris. Per. to 1 ft.: lvs. obovate or lanceolate, nearly entire: fls. blue, rarely white. S. Eu., Caucasus.

GLOBULARIACEÆ. GLOBULARIA FAMILY. Three genera of herbs and shrubs native in S. Eu. and S. W. Asia, with alternate simple lvs., bisexual fls. in dense bracted heads, having 5-parted calyx, 2-lipped gamopetalous corolla, 4 stamens, superior 1-celled ovary, and fr. a nutlet inclosed in the calyx. The family is placed near Acanthaceæ in the natural sequence. Only Globularia is grown for ornament.

GLOMERATE: in dense or compact cluster or clusters.

GLORIOSA. GLORY-LILY. *Liliaceæ.* Climbing herbs with tuberous roots, lvs. prolonged into tendrils, and red or yellow lily-like fls. solitary in the axils of the upper lvs., the perianth-segms. distinct and reflexed or spreading.

Glory-lilies are grown under glass, and out-of-doors in the South. Tubers should be potted from January to March for bloom in summer and autumn. Propagated by offsets or division of the tuber.

Roehrsiana: a garden plant; probably a form of *G. Rothschildiana*.

Rothschildiana. Lvs. broadly lanceolate: fls. crimson, yellow and whitish at base, to 3 in. long, the perianth-segms. broadly lanceolate and sometimes wavy-margined, strongly reflexed. Trop. Afr.

superba. Lvs. lanceolate: fls. yellow changing to red, to 3 in. long, the perianth-segms. narrowly lanceolate and much crisped, usually reflexed. Trop. Afr. and Asia. Var. **grandiflora** is a hort. form.

GLORY-BOWER: *Clerodendrum*.

GLORY-BUSH: *Tibouchina*.

GLORY-FLOWER: *Eccremocarpus*.

GLORY-OF-THE-SNOW: *Chionodoxa*.

GLOSOCOMIA: *Codonopsis clematidea*.

GLOTTIPHYLLUM. *Aizoaceæ*. Genus separated from Mesembryanthemum (which see for cult.): per., stemless or nearly so: lvs. soft and pulpy, long, entire, mostly tongue-shaped or strap-shaped, yellowish-green: fls. large, yellow; stigmas 7–10. S. Afr.

linguiforme (*M. linguiforme*). Lvs. 2-ranked, tongue-shaped, 3 in. long, deflexed: fls. short-stalked; styles 8.

longum (*M. longum. M. pustulatum*). Lvs. long-tongue-shaped, depressed or erect, to 4 in. long, often pustulate or blistered at the base: fls. long-stalked; styles 9.

GLOXINIA: *Sinningia*.

GLUME: a small chaff-like bract; in particular, one of the two empty bracts at the base of the grass spikelet.

GLYCERIA (*Panicularia*). MANNA-GRASS. *Gramineæ*. Mostly tall per. grasses with flat lvs. and spikelets borne in terminal panicles; native in wet places in Eu., Asia and N. Amer. They are coarse meadow grasses of moist lands, and sometimes planted for ornament in wettish places. See *Grasses*.

aquatica (*G. spectabilis*). Differs from its American representative, *G. grandis*, in the larger pale spikelets. Eu., Asia.

grandis. REED MEADOW-GRASS. To 5 ft.: lvs. to 1 ft. long and ½ in. wide, rough above: panicles 1 ft. or more long, the spikelets usually purple. N. Amer.

spectabilis: *G. aquatica*.

GLYCINE. *Leguminosæ*. Herbs twining or erect, with pinnate lvs., papilionaceous not showy fls. in axillary racemes, and narrow long pods which are constricted between the seeds; native in Old World tropics.

One species is grown as a forage and cover-crop, green-manure, and the seeds sometimes for human food. Seeds should be sown in drills 18–20 inches apart in rows 2½–3 feet apart after danger of frost is over.

Apios: *Apios tuberosa*.

floribunda: *Wisteria floribunda*.

hispida: *G. Max*.

Max (*G. Soja. G. hispida. Soja Max*). SOYBEAN. Hairy ann. to 6 ft., erect: lvs. of 3 ovate lfts.: fls. white or purple, not conspicuous: pods to 3 in. long, brown and hairy, hanging. China, Japan.—Much grown.

sinensis: *Wisteria sinensis*.

Soja: *G. Max*.

GLYCOSMIS. *Rutaceæ*. Small spineless evergreen trees or shrubs, one of them a good ornamental under glass and in the open in Fla.: lvs. pinnate: fls. small, white and fragrant, in panicles; stamens 10: fr. berry-like. **G. pentaphylla** (*G. cochinchinensis*), India, Malaya and Philippines, is a bush: lfts. mostly 5–7 but sometimes only 1, long lance-oblong to 6 in. long: fr. about ⅓ in. diam., pinkish and translucent, with 1 or 2 seeds.

GLYCYRRHIZA. LICORICE, LIQUORICE. *Leguminosæ*. Per. herbs or subshrubs with pinnate lvs., papilionaceous fls. in axillary racemes or spikes, and short flattened pods; one species is grown for economic purposes, the roots furnishing licorice.

Licorice should be grown in rich moist soil. Propagated by division of the roots as well as by seeds.

glabra. To 3 ft.: lfts. ovate: fls. pale blue. Medit. region.

GLYPTOSTROBUS. *Pinaceæ*. One small Chinese tree differing from the genus Taxodium chiefly in the elongated rather than peltate cone-scales. **G. pensilis** (*G. sinensis. G. heterophylla*). Lvs. deciduous, linear and 3-ranked or imbricated and scale-like on the fruiting branches: cones ovoid, ¾ in. long. Once planted in N. C., and may stand in protected places as far north as N. Y.

GMELINA. *Verbenaceæ*. Trees and shrubs of Asia and Australia, sometimes planted on our southern borders: lvs. opposite: fls. yellow or brownish, irregular, 2-lipped, in panicled cymes or racemes: fr. a fleshy drupe.

arborea. Deciduous tree to 60 ft.: lvs. cordate-ovate, to 9 in. long, entire, pubescent beneath: panicles to 1 ft. long: fr. ¾ in. long. India, Malaya.

GNAPHALIUM. *Compositæ*. Woolly herbs of wide distribution, having alternate lvs. and heads of small obscure disk-fls.; pappus of bristles; somewhat on the order of everlastings. Sometimes planted for ornament.

lanatum: *Helichrysum petiolatum*.

Leontopodium: *Leontopodium alpinum*.

sylvaticum. Per. to 1½ ft.: lvs. linear, to 2 in. long: heads ¼ in. long, in spikes, bracts of involucre yellowish with brown spot toward tip. Eu., N. Asia, N. E. N. Amer.

GNETACEÆ. GNETUM FAMILY. Three widely distributed genera, of which only Ephedra is occasionally cult., although this genus has recently been segregated in a separate family, Ephedraceæ. It includes the remarkable Welwitschia (or Tumboa) of S. W. trop. Afr. The family is one of the gymnosperms (with the conifers). Trees or shrubs with large or scale-like lvs., unisexual fls., and fleshy or winged frs. The plants have little ornamental value.

GOAT-NUT: *Simmondsia californica*.

GOATS-BEARD: *Aruncus, Tragopogon*.

GOATS-RUE: *Galega officinalis*.

GOBO: *Arctium Lappa*.

GODETIA. *Onagraceæ*. Ann. flower-garden herbs related to Œnothera, commonly erect, with narrow alternate lvs., showy bright red, lilac, purple or white diurnal fls. in leafy racemes or spikes, and capsular frs.

Godetias should have light soil and sunny exposure. Propagated by seeds sown where wanted or under glass for transplanting.

amœna. FAREWELL-TO-SPRING. Slender to 3 ft., mostly an open grower, with scattered fls.: lvs. linear to lanceolate, to 2 in. long: fls. lilac-crimson or red-pink varying to white, to 2 in. across, often double: caps. 1½ in. or more long, slender. Calif. to B. C. Var. **Lindleyi** has a large spot in center of petals.

Bottæ. Slender, to 3 ft.: lvs. linear to lanceolate, to 2½ in. long: fls. pink or light crimson, to 2 in. across. S. Calif.

densiflora: *Boisduvalia densiflora.*

grandiflora (*Œnothera Whitneyi*). Stout, to 1 ft., compact and very leafy: lvs. oblong, to 1½ in. long: fls. aggregated, rose-red varying to white, with darker blotch in center of petals, to 5 in. across: caps. sessile, less than 1 in. long. Calif.—Known in several dwarf or condensed cult. forms.

lepida. Rather tall, erect, branched, the st. flattened above: lvs. oblong- to ovate-lanceolate: fls. rather close together near ends of branches, about 1¼ in. across, petals pale purplish with darker spot in middle at end: caps. short and thick, gray-hairy. Calif.—Little known in cult.

Lindleyi: *G. amœna* var.

parviflora. Branching from base, the sts. a few in. to 2 ft. or more long: lvs. narrow-lanceolate to linear, to 1 in. long: fls. rose-red, to ¾ in. long. Calif.

quadrivulnera. Simple or branched, to 18 in.: lvs. obovate or oblong, the upper ones much narrower: fls. scattered or separated, lilac or pale crimson with darker spot near apex of more or less dentate petals, about ¾ in. across: caps. sessile, 4-sided, ½–1 in. long. Calif. to Columbia River.—Little seen in cult.

rubicunda is a lilac-crimson color-form of *G. amœna.*

Schwaminii is a more or less double-fld. pink form of *G. amœna.*

viminea. Strict, short-branched, to 3 ft., sts. whitish: lvs. linear to lanceolate, entire: fls. purple or crimson with dark center, petals to 1 in. long. Calif., Ore.

Whitneyi: *G. grandiflora.*

GOLD-DUST: *Alyssum saxatile.* **-Tree:** *Aucuba japonica* var. *variegata.*

GOLDEN-BELLS: *Emmenanthe penduliflora, Forsythia.* **-Chain:** *Laburnum anagyroides.* **-Club:** *Orontium aquaticum.* **-Cup:** *Hunnemannia fumariæfolia.* **-Eardrops:** *Dicentra chrysantha.* **-Glow:** *Rudbeckia laciniata* var. *hortensia.* **-Shower:** *Cassia Fistula.* **-Star:** *Chrysogonum virginianum.* **-Stars:** *Bloomeria crocea.* **-Top:** *Lamarckia aurea.* **-Tuft:** *Alyssum saxatile.* **-Wave:** *Coreopsis Drummondii.*

GOLDENRAIN-TREE: *Kœlreuteria paniculata.*

GOLDENROD: *Solidago.*

GOLDENSEAL: *Hydrastis canadensis.*

GOLDFIELDS: *Baeria.*

GOLD-FLOWER: *Hypericum Moserianum.*

GOLDILOCKS: *Linosyris vulgaris.*

GOLDTHREAD: *Coptis.*

GOMESA. *Orchidaceæ.* Brazilian epiphytes with 2–3-lvd. pseudobulbs and yellowish-green fls. in pendulous racemes, the dorsal sepal and petals similar, the lip shorter than sepals; do best in the temperate house. See *Orchids.*

planifolia. Pseudobulbs about 2 in. high: fls. yellowish-green, in many-fld. racemes to 8 in. long, the sepals and petals partially united and slightly wavy, the lip with 2 crests, June–July.

GOMPHOCARPUS. *Asclepiadaceæ.* Per. herbs or subshrubs differing from Asclepias in the hoods without crests or appendages; one species grown out-of-doors in Calif.

textilis. To 3 ft.: lvs. opposite, linear-lanceolate, about 3 in. long: fls. white with violet-lobed crown: fr. bladdery, pale green with bristly hairs, to 4 in. long. Habitat unknown.

GOMPHOLOBIUM. *Leguminosæ.* Australian shrubs with simple or compound lvs., yellow or red papilionaceous fls., and ovoid or globular inflated pods; one species may be planted in S. Calif.

latifolium. Large glabrous shrub: lvs. digitate, of 3 linear or linear-lanceolate lfts. to 2 in. long: fls. yellow, 1 in. or more across, in loose racemes, the keel densely fringed.

GOMPHRENA. *Amaranthaceæ.* Erect or prostrate per. and ann. herbs, *G. globosa* grown as an "everlasting," having clover-like, white, red or violet heads; useful for bedding, for cut-fls. and for winter decoration. For cult. see *Everlastings;* grown readily from seeds.

decumbens. Ann., prostrate or decumbent, the much branched sts. to 2 ft. long: lvs. oblong or oval, to 3 in. long: heads subtended by 2 bracts, white, ½ in. or less across. Tex., Mex. to S. Amer.

globosa. Globe Amaranth. Ann., erect, branching, somewhat stiff, to 1½ ft.: lvs. oblong to elliptic, to 4 in. long, ciliate on edge: heads subtended by 2 leafy bracts, purple, orange, rose, white, variegated, about 1 in. across, not as papery as most everlastings. Old World tropics. Var. **aurea** has yellow fls.

Haageana. Per. to 2½ ft. but grown as ann.: lvs. oblanceolate to oblong-linear, to 4 in. long: heads subtended by 2 bracts, light red with yellow florets, 1 in. across. Tex., Mex.

nitida. Ann. to 2½ ft., usually erect: lvs. obovate to oval, to 2½ in. long: heads subtended by 2 lvs., bracts white, ½ in. across. Ariz. to Mex.

GONGORA. *Orchidaceæ.* Trop. American epiphytes having pseudobulbs which bear 2 plaited upright lvs. and a pendulous raceme from near the base, the fls. with the dorsal sepal and the small petals attached to the column, the lateral sepals spreading and the lip with 2 horned lobes and the central lobe saccate; grown in the temperate greenhouse. For cult. see *Orchids.*

Charlesworthii: *G. Scaphephorus.*

galeata (*Acropera Loddigesii*). Pseudobulbs about 2½ in. long: lvs. to 1 ft. long and 2½ in. wide: fls. brownish-yellow, in racemes to 8 in. long, June–Aug. Mex.

Scaphephorus (*G. Charlesworthii*). Pseudobulbs 3 in. long: fls. yellowish-white spotted purple-brown, fragrant, in 12–20-fld. racemes to 2 ft. long. Peru.

GONIOLIMON: *Limonium.*

GONIOPHLEBIUM: *Polypodium subauriculatum.*

GOOBER: *Arachis hypogæa.*

GOODENIACEÆ. Goodenia Family. Herbs, subshrubs or rarely shrubs of 12 genera mostly in Australia, characterized by bisexual fls. with very small calyx, 5-lobed corolla, 5 stamens, inferior or partially superior 1–2-celled ovary, and fr. a caps., drupe or nut. The genus Leschenaultia may be planted in S. U. S.

GOODIA. *Leguminosæ.* Australian shrubs with compound lvs. of 3 entire lfts., papilionaceous fls. in racemes, and flat pods; one species is grown in S. Calif. for ornament.

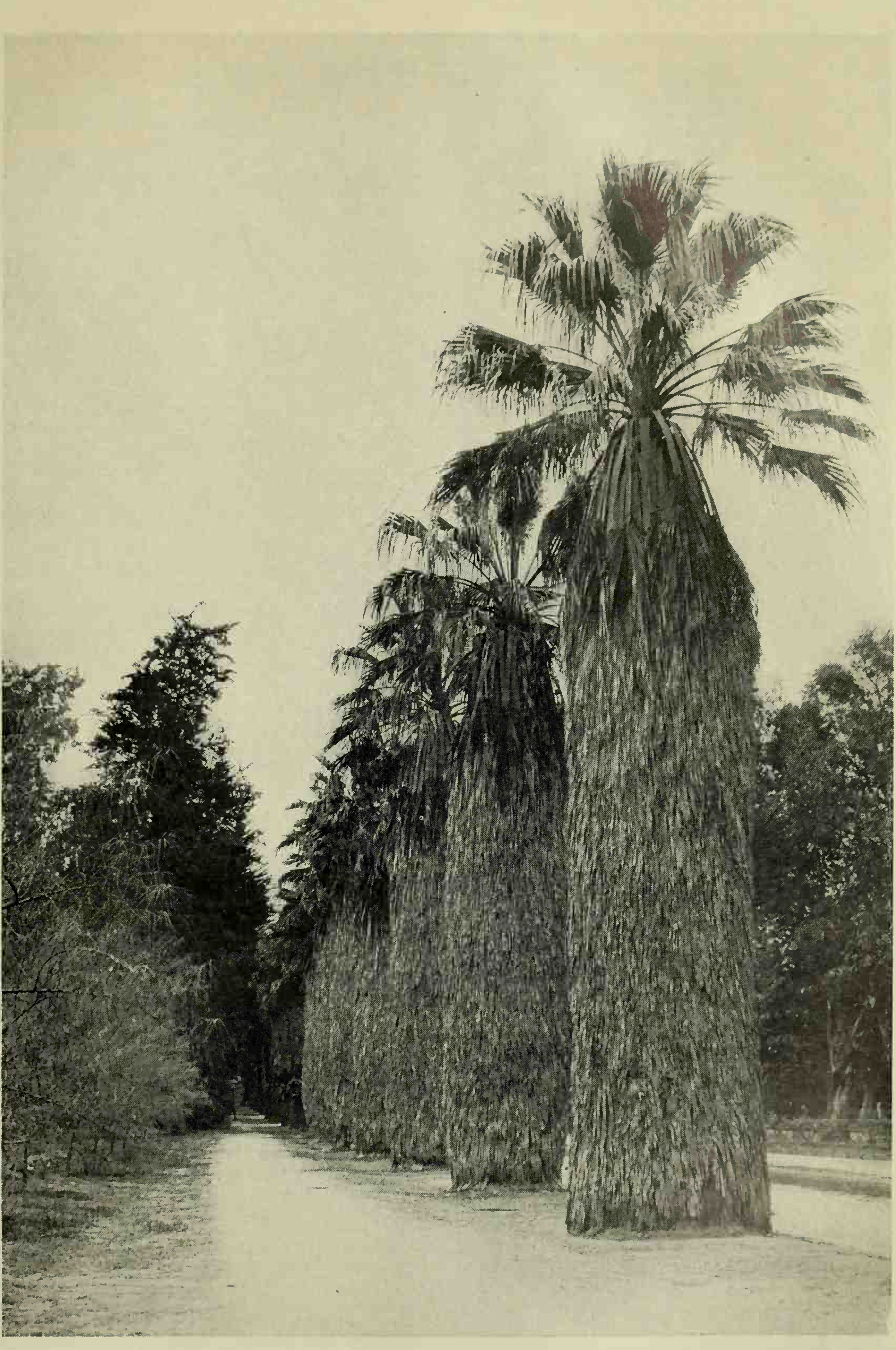
lotifolia. Tall, much branched: lfts. ovate, to ¾ in. long: fls. yellow, the standard purple at base, in racemes to 4 in. long: pods to 1 in. long.

GOOD KING HENRY: *Chenopodium Bonus-Henricus.*

GOODYERA: *Epipactis, Hæmaria.*

GOORA NUT: *Cola acuminata.*

GOOSEBERRY: *Ribes;* see *Currant.* **Barbados-:** *Pereskia aculeata.* **Cape-:** *Physalis peruviana* and



VIII. California Fan-Palm. — *Washingtonia filifera* in its characteristic stateliness and beauty when planted so that it may develop and remain naturally

pruinosa. Ceylon-: *Dovyalis hebecarpa.* Hill-: *Rhodomyrtus tomentosa.* Otaheite-: *Phyllanthus acidus.* -Tree: *Phyllanthus acidus.*

GOOSEFOOT: *Chenopodium.*

GORDONIA. *Theaceæ* (*Ternstrœmiaceæ*). Trees or shrubs in warm Asia and 2 in the U. S., with alternate simple lvs., showy white fls. solitary in the axils, and capsular frs.; the American species below are hardy in the southern states and succeed in moist peaty or sandy soil. Propagated by seeds, layers or greenwood cuttings under glass.

alatamaha (*Franklinia alatamaha. G. pubescens*). The specific name is commonly but not originally spelled *altamaha.* Tree to 20 ft., deciduous: lvs. to 6 in. long, bright green and shining above, pale beneath, turning scarlet in autumn: fls. 3 in. across, very short-stemmed. Ga., but now known only in cult.; hardy to Mass.; blooms in autumn.

anomala: *G. axillaris.*

axillaris (*G. anomala*). Large evergreen shrub: lvs. to 6 in. long, dark green above: fls. to 3 in. across, nearly sessile. S. China.

Lasianthus. LOBLOLLY BAY. To 60 ft., evergreen: lvs. to 6 in. long, dark green and shining above: fls. 2½ in. across, long-stemmed. Va. to Fla. and La.

pubescens: *G. alatamaha.*

GORMANIA. *Crassulaceæ.* A few low per. sedum-like plants of W. U. S., with horizontal rootstocks, spatulate to ovate or nearly orbicular flat blunt lvs. similar in the basal and cauline parts but the latter smaller: fls. yellow to red, in terminal clusters; petals 5, united at base, and stamens 10: carpels many-seeded.

laxa. Green and glabrous, to 12 in. high: lvs. spatulate, about ¾ in. long: fls. pink or red, nearly ½ in. long, in a loose cluster 4 in. across. Ore.

obtusata (*Sedum obtusatum*). Green or somewhat glaucous, to 6 in. high: lvs. spatulate, to ¾ in. long: fls. yellow, with acute or acuminate segms. little longer than filaments, in a rather narrow cluster. Calif., in the Sierras.

oregana (*Sedum oreganum*). Green, to 6 in. high: lvs. spatulate-cuneate, less than ¾ in. long: fls. bright yellow fading pink, the narrow long segms. much surpassing the stamens, in a compound cluster to 3 in. across. N. Calif. to Alaska.

GORSE: *Ulex.*

GOSSYPIUM. COTTON. *Malvaceæ.* Trop. shrubs, or woody herbs, sometimes tree-form, of eastern and western hemispheres, with alternate lvs. which are palmately lobed or ribbed, large white, yellow or purplish fls. in an involucel of bracts, and capsular frs. or "bolls" whose seeds bear fleece or lint furnishing the cotton of commerce, and sometimes with an additional fuzz or wool. The different species and races are supposed to be extensively hybridized, and the botany of the genus is difficult. The origin of the cult. cottons is not well understood.

Cotton is grown as an annual field crop in the southern United States. It requires a long season and plenty of moisture throughout the growing period, and dry weather for harvesting. About 1 bushel of seed is customary to plant an acre. The rows should be 3–4 feet apart and the plants in the row 1–2 feet apart. It is rarely grown as an ornamental plant, and it usually does not thrive in economic collections under glass; it is strictly not a horticultural subject and is not further discussed in this Hortus.

arboreum. TREE C. of INDIA. To 10 ft., with trailing branches: lvs. 3–7-lobed two-thirds or more their depth: fls. purple-red, the bracts of involucel united at base: seeds with persistent fuzz. Old World.

barbadense. SEA-ISLAND or TREE C. To 8 ft.: lvs. 3–5-lobed half or more their depth: fls. yellow tinged purple, bracts of involucel nearly or quite distinct: seeds without persistent fuzz, bearing a long staple. Trop. Amer.

brasiliense. Closely resembling *G. barbadense* but with larger lvs. and fls.: lvs. glabrous, cordate, lobes 5 and acuminate and the middle one longest. Trop. Amer.

herbaceum. LEVANT C. Ann. herb: lvs. 5–7-lobed less than half their depth: fls. yellow with purple center, bracts of involucel joined at base: seeds with persistent gray fuzz. Arabia, Asia Minor.

hirsutum. UPLAND C. Ann. or mostly so, to 5 ft.: lvs. 3-lobed about half their depth: fls. white or light yellow, becoming pink or purple, the involucel bracts not united: seeds with persistent greenish fuzz. Trop. Amer.; probably the principal source of American upland cottons. Var. **religiosum** is of trailing or climbing habit, with pubescent lvs. and rust-colored fuzz.

indicum. CHINESE or INDIAN C. Small ann. or per.: lvs. 3-lobed to about half their depth: fls. yellow, in involucel bracts united at base: seeds with persistent reddish fuzz. E. Asia.

mexicanum. MEXICAN C. Shrubby: lvs. 3–5-lobed to about one-third their depth: fls. pale yellow or white tinged pink, bracts of involucel not joined: seeds with persistent gray fuzz. Mex.

obtusifolium. CEYLON or ORIENTAL C. Shrub: lvs. 3–5-lobed to less than half their depth: fls. yellow with purple center, involucel bracts united: seeds with pubescent gray or reddish fuzz. Ceylon.

peruvianum. PERUVIAN C. Lvs. divided half or three-fourths their depth: fls. yellow, involucel bracts distinct; seeds with persistent gray, rusty or greenish fuzz. Cent. and S. Amer.

punctatum. JAMAICA C. Woody: lvs. divided one-half their depth: fls. yellow with brown center, involucel bracts distinct: seeds with persistent gray or rusty fuzz. Trop. Amer., Afr.

vitifolium. Closely resembling *G. barbadense* but the lvs. hairy beneath and fls. often thrice longer than involucel. Trop. Amer.

GOURD. A general or indefinite name applied to various kinds of cucurbits, plants allied to the pumpkins, cucumbers and melons. The yellow-flowered gourds of American gardens are *Cucurbita Pepo* var. *ovifera;* the white-flowered gourds are *Lagenaria leucantha.* The snake or serpent gourds are either *Lagenaria leucantha* or *Trichosanthes Anguina.* White or wax gourd is *Benincasa hispida.* Dishcloth gourds are Luffas, mostly *L. cylindrica.* The maté gourd of Paraguay, used as a utensil, is a small form of *Lagenaria leucantha.* Gooseberry gourd is *Cucumis Anguria,* hedgehog gourd *C. dipsaceus,* cranberry gourd *Abobra tenuifolia* and ivy gourd *Coccinia cordifolia.* Calabash gourds are *Lagenaria leucantha,* but the calabash itself is not a gourd but the fruit of a tropical tree, *Crescentia Cujete.* Sometimes the word gourd is applied in a general way to all the cultivated species of Cucurbita. In North America the word is employed for fruits grown as ornaments or curiosities rather than for food.

All the gourds denoted above are annual plants (or treated as such) of the simplest cultivation, requiring the treatment accorded pumpkins, cucumbers and melons. Seeds are commonly sown where the plants are to stand, as soon as the weather is warm and settled. If wanted earlier, they may be started in pots or boxes, but they do not transplant readily if the roots are disturbed. All of them are frost tender. The vines make good screens and covers if given support. See *Cucurbita, Pumpkin.*

GOURLIEA. *Leguminosæ.* Probably only one species, native of Chile. **G. spinosa** (*G. chilensis. G. decorticans* and var. *subtropicalis. Lucuma spinosa*). Small spiny tree to 12 ft.: lvs. of 3 pairs of small ovate lfts.: fls. orange-yellow streaked red, in short loose racemes: fr. about 1 in. diam., brownish. In S. Calif.

GOUTWEED: *Ægopodium Podagraria.*

GOVERNORS-PLUM: *Flacourtia indica.*

GRABOWSKIA. *Solanaceæ.* Spiny shrubs with entire sometimes fleshy lvs., small funnel-shaped violet, pale blue or whitish fls. with exserted stamens, and fr. a berry; native in S. Amer., one grown in Calif. for ornament.

boerhaaviæfolia (*G. glauca*). Lycium-like shrub with graceful drooping habit, axillary spines ¼ in. long: lvs. oval to oblong, to 1½ in. long, gray-green: fls. white or pale blue, inconspicuous, in clusters or solitary: fr. to ½ in. long. Peru.

glauca: *G. boerhaaviæfolia.*

GRAFTAGE (French *greffage*) comprises the general subject of propagating or growing plants by means of a cutting or part taken from one plant and inserted on another. The reasons for the operation are chiefly two: to perpetuate a variety or variation (as Fameuse apple or Caractacus rhododendron) that does not come true from seed and is not readily raised from cuttings; to propagate a species that does not produce seed in its adopted country and does not grow acceptably from cuttings. It differs from the making of cuttings in the fact that the severed part, or cion, grows on another plant, or stock, rather than in the soil; the particular variety or species does not grow on its own root.

There are two general kinds of grafting, differing in practice but not in principle,—one of which inserts a piece of branch in the stock (grafting proper), and one that employs only a bud with little or no wood attached (budding). In both cases the success of the operation depends on the growing together of the cambium of the cion (or cutting) and that of the stock. The cambium is the new and growing tissue which lies underneath the bark and on the outside of the growing wood. Therefore, the line of demarcation between the bark and the wood should coincide when the cion and stock are joined. The greater part of grafting and budding is performed when the cion or bud is nearly or quite dormant, that is, usually in winter and early in spring, and budding may be undertaken then, or late in summer when the buds have nearly or quite matured.

When the parts are joined, the wounded or exposed surfaces are securely covered with wax or bandage to prevent evaporation as well as to hold the cions and surfaces securely in place. A good wax for covering the exposed parts is made as follows: Resin 4 parts by weight; beeswax, 2 parts; tallow, 1 part. In making the wax, the materials are first broken up and melted together. When thoroughly melted the liquid is poured into a pail or tub of cold water. It soon becomes hard enough to handle, and it is then pulled and worked over until it becomes tough or "gets a grain," at which stage it attains the color of very light-colored manila paper. When wax is applied by hand, the hands must be well greased. Hard cake tallow is the best material for this purpose. In top-grafting large trees in the open, it is well to carry a reserve supply of tallow when waxing, by smearing the backs of the hands before entering the tree.

Melted paraffin has lately been employed with good results to cover even green not dormant cions,—buds, wounds and all. This prevents loss of moisture and allows grafting to be undertaken over a good part of the year.

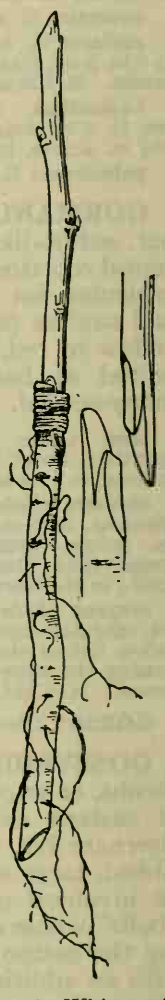


Fig. 1. Whip-graft. At right, the stock and cion ready to be joined. Left, the parts put together and tied.

As the prime object of grafting is to perpetuate a kind of plant that does not reproduce itself from seed or of which seed is very difficult to obtain, cions or buds are therefore taken from this plant and set into whatever kind of stock is available on which they will grow. Thus, if one wants to propagate the Fameuse apple, one does not for that purpose sow seeds of it, but takes cions or buds from a Fameuse tree and grafts them into some other apple tree. The stocks are usually obtained from seeds. In the case of the apple, young plants are raised from seeds obtained mostly from cider mills, without reference to the variety from which they came. When the seedlings have grown to a certain age, they are budded or grafted; and thereafter they bear fruit like that of the tree from which the cions were taken. In this example the cion and stock are of the same species, *Pyrus Malus*, but in other cases the two may represent quite different kinds of plants; and in that case one must make sure that the two parts are congenial the one to the other. Thus, the pear is made dwarf by grafting it on the quince; *Magnolia Soulangeana* varieties may be grown on *M. acuminata;* spruces of different species may be successfully grafted on the Norway spruce.

Grafting proper, as we have seen, is the insertion of a small branch (or cion), usually bearing more than one bud. In grafting on small stocks, it is customary to employ the whip-graft (Fig. 1). Both stock and cion are cut across diagonally, and a split made in each, so that one fits into the other. The graft is tied securely with a band, and then, if it is above ground, it is also carefully waxed.

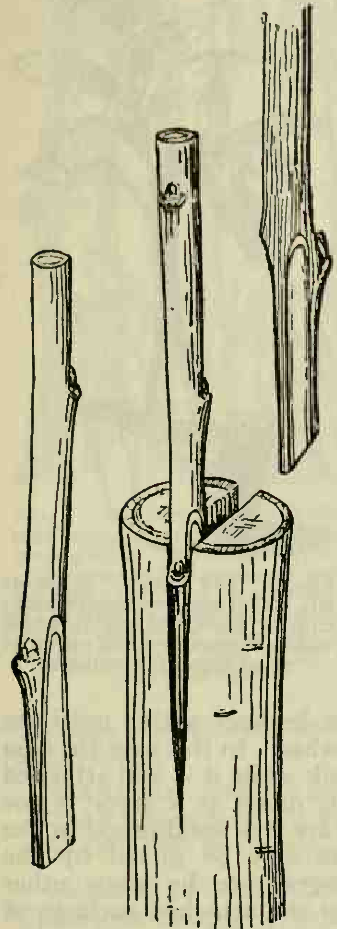


Fig. 2. Cleft-graft. Stock in center, with one cion set and another one to be set on the right; at the left, to show how the cion is shaped.

In larger limbs or stocks out-of-doors the usual method is the cleft-graft. This consists in cutting off the stock, splitting it from the top for a short distance and inserting a wedge-shaped cion in one or both sides of the split, taking care that the cambium layer of the cion matches that of the stock. The exposed surfaces are then securely covered with wax. Grafting in the open is usually performed early in the spring, just before the buds swell. The cions should have been cut before this time, when they were perfectly dormant. Cions may be stored in sand in the cellar or in the ice house, or they may be buried in the field. The object is to keep them fresh and dormant until they are wanted.

If it is desired to change the top of an old plum, apple or pear tree to some other variety, it is usually accomplished by means of the cleft-graft (Fig. 2). If the tree is very young, budding or whip-grafting may be employed. On an old top the cions should begin to bear when three or four years old. All the main limbs should be grafted. It is important to keep down the suckers or water-sprouts from around the grafts, and part of the remaining top should be cut away each year until the top is entirely changed over (which will result in two to four years).

For grafting small mostly pot-grown material under glass the veneer-graft is commonly employed (Figs. 3, 4). The cion is cut to a slant at the lower end and then shaved or champered to correspond with a matrix in the stock. The two are bound together, with raffia or waxed cord, and as the subjects are usually kept close in a frame to prevent drying out, the work is not sealed with wax. Many woody ornamental plants are grafted in this fashion.

Budding consists in inserting a bud underneath the bark of the stock, and the commonest practice is that shown in the illustration. Budding is mostly performed in July, August and early September, when the bark is still loose or will peel. Twigs are cut from the tree which it is desired to propagate, and the buds are cut off with a sharp knife, a shield-shaped bit of bark (with possibly a little wood) being left with them (Fig. 5). The bud is then shoved into a slit made in the stock, and it is held in place by tying with soft strand. In two or three weeks the bud will have "stuck" (that is, it will have grown fast to the stock), and the strand is cut to prevent its strangling the stock. Ordinarily the bud does not grow until the following spring, at which time the entire stock or branch in which the bud is inserted is cut off an inch above the bud; and the bud thereby receives all the energy of the stock. Budding is the commonest grafting operation in nurseries. Seeds of peaches may be sown in spring, and the plants which result will be ready for budding the same August. The following spring, or a

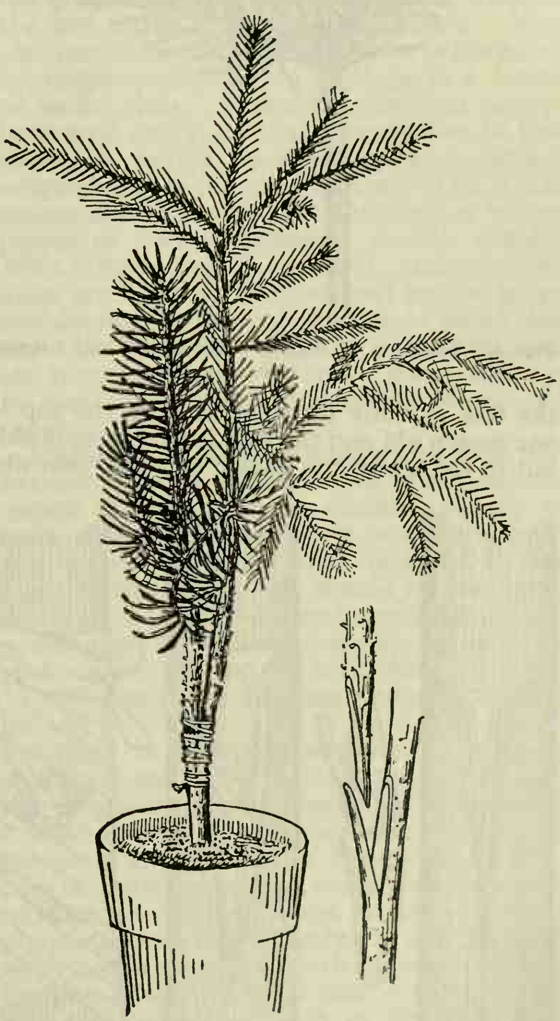


Fig. 3. Veneer-graft, or side-graft; method of making the cuts is shown in the detail.—Norway spruce.

year from the planting of the seed, the stock is cut off just above the bud (which is inserted near the ground), and in the fall of that year the tree is ready for sale; that is, the top is one season old and the root is two seasons old, but in the trade it is known as a one-year-old tree. In apples and pears the stock is usually two years old before it is budded, and the tree is not sold until the top has grown two or three years. Budding may be performed also in the spring, in which case the bud grows the same season. Budding is always undertaken in young branches or parts, preferably in those not more than one year old.

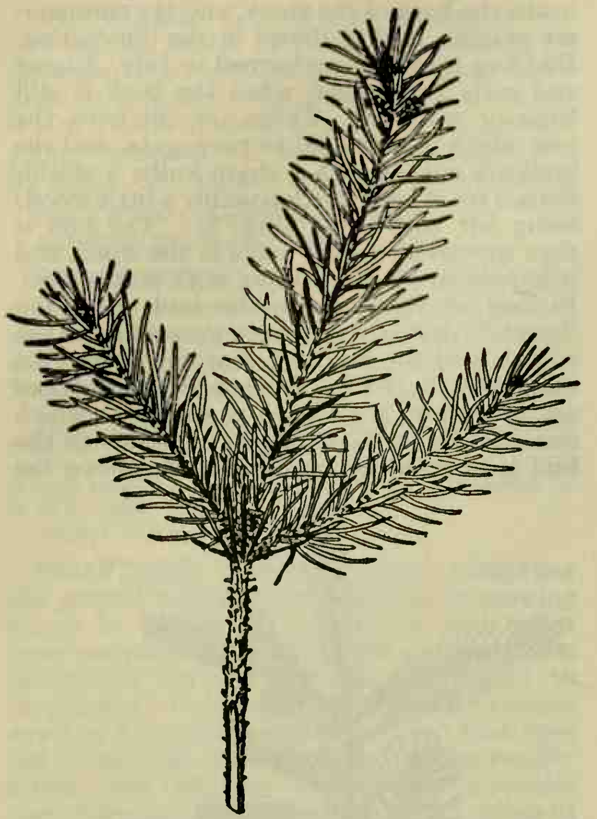


FIG. 4. The cion of Fig. 3.—About one-half natural size.

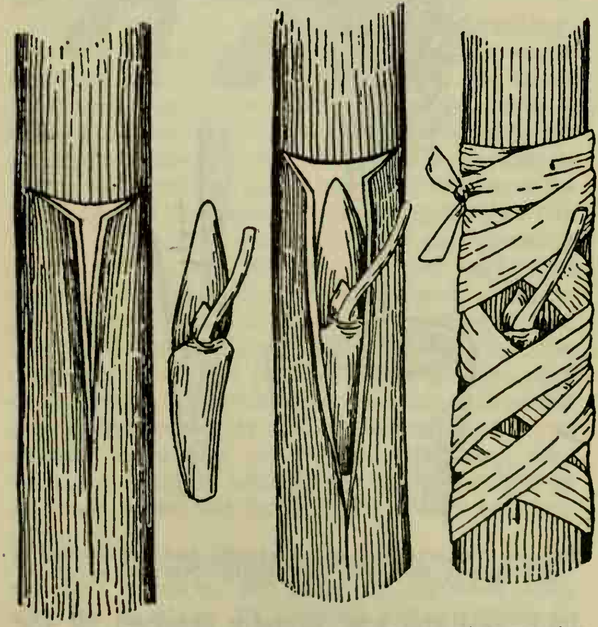


FIG. 5. Budding. Left: the bark opened to receive the bud; the bud; the bud inserted; tied.

Many other fashions of preparing the stock and cutting the cion are employed for particular plants and to satisfy the preference of the grafter. The consultant interested in the subject may consult the Standard Cyclopedia of Horticulture and other more detailed writings.

Inarching, sometimes called "grafting by approach," is a special method when union between cion and stock takes place slowly and with difficulty and the cion must therefore be kept active until the two are grown together. In this case the cion is joined to the stock while it is still attached to its parent plant, much as a layer is not severed until roots are well established in the ground. The parts may be joined by the tongue of a whip-graft or by some other method (sometimes the attached surfaces of cion and stock being only cut away to young wood) and then tied together securely and waxed. When union has taken place, the cion is cut back at the top and it is severed from its own branch; it is then permanently transferred to the stock. Fig. 6 illustrates the method.

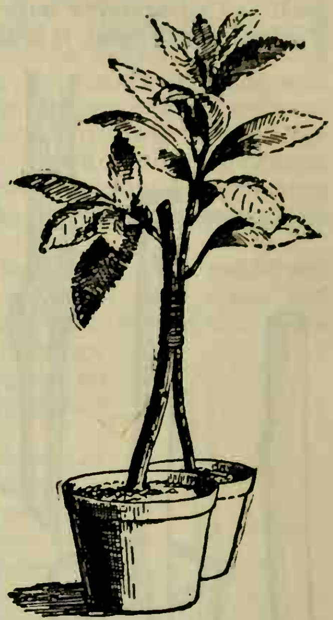


FIG. 6. The inarch. Stock at left, which has been headed back; cion or inarch at right, which will be severed from its own root when union is complete.

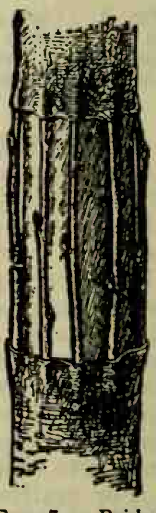


FIG. 7. Bridge-grafting, in which the cions are inserted under the bark.

Bridge-grafting is not a method of propagation but only a means of healing or overcoming wounds. Oftenest it is employed when a tree is girdled. The wound is trimmed away on either edge to fresh clean bark and wood, and long cions cut wedge-fashion at either end are slipped underneath the bark below and above the wound as in Fig. 7, or nailed in exposed channels as detailed in Fig. 8. The bark over the cion-ends is then firmly tied to keep them securely in place, and sometimes a small tack is driven through either end of the cions. The work is then waxed over to protect wound and cions alike. Shoots should be prevented from growing from the cions. In due time the wound is bridged by the ring of cions, and eventually should be completely covered by a new solid growth of wood. G. W. Peck writes in Cornell Extension Bulletin No. 154 and from which Fig. 8 is adapted: "It is a waste of time to bridge-graft a tree with small undeveloped puny cions. If large one-year-old shoots are not available, two-year-old vigorous growths will be found to give good satisfaction."

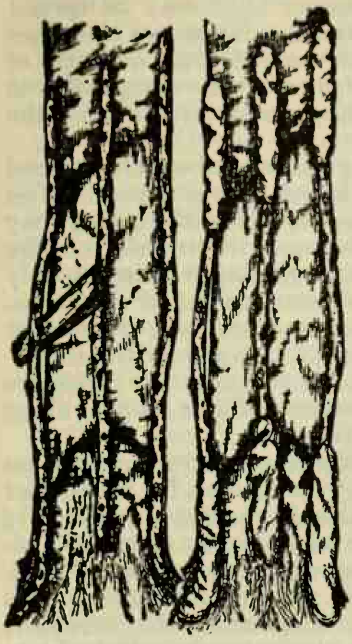


FIG. 8. Another form of bridge-grafting, a process of repair not of propagation. The cions are nailed at the ends, and then waxed as at the right. To allow for movement of the trunk, a wedge is sometimes placed under the cions at the middle to make them bulge or curve outward.

GRAHAMIA: *Helenium aromaticum.*

GRAM: *Phaseolus aureus* and *Mungo.*

GRAMINEÆ: see Grasses.

GRAMMATOPHYLLUM. *Orchidaceæ.* Epiphytes having pseudobulbs, thick strap-shaped lvs., and showy fls. in loose many-fld. racemes, the sepals and petals nearly equal, the lip smaller. For cult. see *Orchids.*

speciosum. Fls. to 7 in. across, yellow spotted with brown, the fl.-scape to 6 ft. high and bearing as many as 100 fls. Malaya, Philippine Isls.

GRANADILLA: *Passiflora.*

GRAPE. Species of Vitis (which see) grown for the berry-like fruits. The grape in some of its many species, hybrids and races is grown over the greater part of North America except the regions of extreme cold. Of the native species, the Fox grape type (*Vitis Labrusca*) is of greatest importance and with its hybrids is the mainstay of grape-growing east of the Rocky Mountains, reaching its greatest perfection in the fruit regions of the Hudson Valley and in proximity to the Great Lakes. The Old World grape (*V. vinifera*) grows to advantage only in the mild climate of the Pacific coast and adjacent parts, particularly California where it is grown very extensively, making up nearly three-fourths of the commercial grape crop of the United States. The native Muscadine grape (*V. rotundifolia*) is grown in the cotton-belt as a home and local fruit but has little general commercial importance. These groups comprise three cultural classes. To these classes may be added the growing of grapes under glass, for which a separate discussion is required.

Soils of various kinds yield good grapes provided they are fairly deep and well drained. Sandy or gravelly clay loams are most desired. Usually better success results in soils not too fertile, as the resulting over-vegetative condition is likely to be non-fruitful and difficult to control. Grapes are naturally drought-resistant.

Propagation of most of the eastern-grown varieties of grapes is by stem-cuttings about one foot in length made from prunings. These are taken in winter and are stored in moist sand or sawdust to callus. The cuttings are planted out in the nursery-row in early spring, placing the top bud level with the surface of the ground; they make marketable vines at the end of the first or second season. New and rare varieties are sometimes propagated by single-eye hardwood cuttings in a frame or under glass. Muscadine cuttings cannot be rooted easily, so that propagation of this species is mainly by stem-layers, a method adapted also to the other species. Old World grapes must be grafted on cuttings or young plants of native American stocks, usually *Vitis riparia* and *V. rupestris*, otherwise the vines are likely to be destroyed by the grape root-louse (Phylloxera), in regions where the pest has been introduced. If the viniferas are grown on their own roots, propagation is by means of cuttings of dormant one-year-old canes.

Planting and distance vary with region and variety. Either one-year or two-year-old rooted cuttings may be planted, usually in early spring. In the East rows are commonly 8–10 feet apart with vines 8 to 10 feet apart in the rows which should extend north and south. On arbors and against buildings a vine may occupy more space. Muscadine grapes are planted 12 x 12 feet, or even 15 x 20 feet with vigorous varieties on rich ground.

Tillage is a prime requisite. The most successful cultural method is to plow or disk the vineyard in late autumn or early spring and till continuously throughout the growing season or until the last of July when a cover-crop of clover, oats, rape, cowhorn turnips or a mixture of some of them is sown. Home plantings may be successful in sod provided the vines are mulched with manure or straw to keep down the grass and if they receive nitrate. Nitrate of soda at the rate of 1 pound to the vine applied in early spring helps to stimulate growth on poorer soils. Potash is sometimes beneficial. A complete fertilizer may also benefit the vines indirectly by its effect on the cover-crop.

Pruning of the vine is essential to success in grape-growing. To understand the pruning of American vineyard grapes, the operator must grasp this principle: *Fruit is borne on wood of the present season, which arises from wood of the previous season.* To illustrate: A growing shoot or cane of 1930, makes buds. In 1931 a shoot arises from each bud; and near the base of this shoot the grapes are borne (1 to 4 clusters on each shoot). While every bud on the 1930 shoot may produce shoots or canes in 1931, only the strongest of these new canes bear fruit. The skilled grape-grower can tell by the looks of his cane (as he prunes it in winter) which buds will give rise to the best grape-producing wood the following season. The larger and stronger buds usually give best results; but if the cane itself is very big and stout, or if it is very weak and slender, he does not expect good results from any of its buds. A hard well-ripened cane the diameter of a man's little finger is the best size. Another principle to be mastered is this: *A vine should bear only a limited number of clusters,*—say 30 to 80. A shoot bears clusters near its base; beyond these clusters the shoot grows on into a long leafy cane. An average of two clusters may be reckoned to a shoot. If the vine is strong enough to bear 60 clusters, 30 good buds must be left at the pruning (which is December to late February).

The essential operation of pruning a grape vine, therefore, is each year to cut back a limited number of good canes to a few buds, and to cut off entirely all the remaining canes or wood of the previous season's growth. If a cane is cut back to 2 or 3 buds, the stub-like part that remains is called a spur. Present systems, however, cut each cane back to 8 or 10 buds (on strong varieties), and 3 or 4 canes are left,—all radiating from near the head or trunk of the vine. The top of the vine does not grow bigger from year to year, after it has once covered the trellis, but is cut back to practically the same number of buds each year. Since these buds are on new wood, it is evident that they are each year farther and farther removed from the head of the vine. To obviate this difficulty, new canes are taken out each year or two from near the head of the vine, and the two-year or three-year-old wood is cut away.

At planting the vine is cut back to 3 or 4 eyes, and the roots are well shortened in. The hole in which the plant is to be set should be large enough to allow a full spreading of the roots. Fine soil should be worked around the roots and firmed with the feet. If the season should be dry, a mulch of coarse litter may be spread around the vine. If all the buds start, the strongest one or two may be allowed to grow. The canes arising from these buds should be staked and allowed to grow through the season; or in large plantations the first-year canes may be allowed to lie on the ground. The second year one cane should be cut back to the same number of eyes as the first year. After growth begins in the spring, two of the strongest buds should be allowed to remain. These two canes now arising may be grown to a single stake through the second summer, or they may be spread horizontally on a trellis. These are the canes which form the permanent arms or parts of the vine. From them start the upright shoots which, in succeeding years, are to bear the fruits.

Training of the grape must be distinguished from pruning, although one is dependent on the other. A dozen systems of training may be practiced on the same trellis and from the same style of pruning,—for training is only the disposition or arrangement of the parts. On arbors, it is best to carry one permanent arm or trunk from each root over the framework to the peak. Each year the canes are cut back to short spurs (of 2 or 3 buds) along the sides of this trunk.

In the East grapes are grown mostly on two-wire trellises; the lower wire is 2½ feet above the ground and the second wire 2½ feet higher. The wires are attached to 7–8-foot posts at intervals of every three vines. There are various systems of training. In one of the best, known as the four-cane Kniffin system, a single trunk is brought to the top wire. From this trunk four canes are allowed to grow, two at the level of each wire, one being tied along the wire in each direction at each level. These four side arms are renewed every year, using the new canes that arise from spurs near the trunk. In this and in other systems of trellis pruning it is aimed to leave about 30 to 40 buds to the vine. On arbors more buds are left as the vines have more room. In pruning arbor vines about half or three-quarters of the previous season's growth is removed, always leaving the more vigorous wood.

The vinifera grapes require much the same mode of pruning as the others except that in field culture they are usually not trained on wires or even to posts. The old trunk is kept short and stump-like, by constant pruning forming a head of short branches and spurs. The canes are cut back every year nearly to this head. A mature head after four or more years will bear 5 to 20 spurs, depending on variety, vigor, distance of planting and other factors.

In harvesting table grapes the mature clusters are cut carefully from the vines with a knife or shears and placed in shallow boxes or trays which are hauled to the packing-house. A large part of the eastern crop is packed in climax baskets and sold either in the local or general market. Grape-juice factories take large quantities of grapes in some districts. Much of the California crop is dried for raisins.

Yields vary greatly. In the East vines trained on trellises may be expected to yield at the rate of 10 to 20 pounds (25–60 bunches) of fruit to the vine, or 3–5 tons an acre depending on the variety and the vigor of the vines. Individual vines on arbors may yield more than this. Some long-keeping varieties, as Catawba, can be held in common storage at about 40° F. for three to five months. At 30° F. an even longer storage season is possible. In California the acre yields are usually greater than in the East.

Because of the great variation in hardiness, ripening season, and resistance to disease the planter, in choosing varieties, should be sure that they are adapted to his particular region. Many varieties are self-sterile so that two or more should be planted near together. Varieties are listed below in order of their ripening. Commercial varieties are starred.

Short-season varieties for the East of more than average hardiness: Moore Early, Winchell, Champion, Early Daisy, Campbell Early, Jessica, Lucile, Lady.

Varieties adapted to fruit regions of New England, New York and Michigan: Winchell, *Moore Early, Campbell Early, Diamond, *Worden, *Delaware, *Concord, Herbert, *Niagara, Agawam, Barry, *Catawba.

Varieties requiring a long season to be grown only in regions south of New York: Iona, Missouri Reisling, Catawba, Pocklington, Jefferson, Goethe, Triumph.

Varieties recommended for Florida: Csaba, Brilliant, R. W. Munson, Ives, *Carman, *Ellen Scott, Armalaga, Fern, Herbemont.

Muscadine varieties for planting in the South: Eden, Scuppernong, Thomas, Flowers, James, Mish.

Varieties of bunch grapes successful in the southern states: Moore Early, Winchell, Diamond, Brighton, Delaware, Ives, Carman, Catawba, Jefferson, Herbemont.

Vinifera varieties grown as table grapes on the Pacific Coast: Mission, Muscat of Alexandria, Malaga, Thompson Seedless, Flame Tokay, Purple Cornichon, Emperor, Almeria.

Varieties of good keeping quality: Vergennes, Catawba, Mills, Herbert, Barry, Agawam, Canandaigua, Dutchess, Lindley.

In many parts of the East, grapes yield sufficient fruit for home use without spraying of any kind. Frequently, however, the diseases black-rot and downy-mildew may largely destroy fruit and foliage. Control of both is possible by thorough spraying with bordeaux mixture, 4 pounds copper sulfate, 4 pounds slaked lime, 50 gallons water. This should be applied when the plants are in bloom and several times later at two- to three-week intervals. The grape root-worm is often a destructive pest. Spraying the foliage with powdered lead arsenate 3 pounds to 50 gallons water, when the injury is first seen on the leaves, will help control the insect.

Under glass, or in "the grapery," various kinds of *Vitis vinifera* may be grown successfully either with heat or without it. With careful choice of varieties and the protection that may be given both vine and fruit, and the skill that is likely to be applied by the gardener in such circumstances, superior grapes for the table may be produced; it is an old and accepted method in horticultural annals, although it has fallen into relative disuse.

The grapery may be a glass lean-to against a building or wall, or a separate independent structure. The method of growing is the same in either case. The vines are set about 4 feet asunder in a single row or line in the space between the central walk and the side of the structure. The roots are supposed to feed both inside and outside the house, openings being left in the foundation to allow them to reach the outer border. A good deeply prepared outside border several feet wide is required, and it has been customary to underlay this with a sloping cement, brick or rubble bottom to insure quick drainage of surface water; much of course depends on the particular place and climate. Weeds and bushes should not be allowed to grow on the border. One strong cane is trained up under the glass roof but hanging some 18 inches below it. This vine is pruned to spurs. The number of clusters is controlled by the pruning; and if there is likely to be too many, some of the buds may be removed. If the grapery is heated, clusters may be left to ripen on the vines till November and December. Usually the vines are laid down and covered for the winter, the heat being discontinued. The leading variety for growing under glass is Black Hamburg, particularly for the cold grapery. Alexandria, Barbarossa, Chasselas Musque, Gros Coleman, Muscat Hamburg, are among those more particularly adapted to the warm grapery or long-ripening season.

GRAPEFRUIT: *Citrus paradisi*; see *Citrus Fruits* (page 156).

GRAPE, OREGON-: *Mahonia nervosa.* **Sea-:** *Coccolobis uvifera.* **Tail-:** *Artabotrys.*

GRAPTOPETALUM. *Crassulaceæ.* Segregate from the American species formerly included in Cotyledon, native in Ariz. and Mex., distinguished particularly by rotate corolla with petals united at base and illustrated with dots or transverse bands: stemless or nearly so, with thick lvs. forming a small rosette as in Echeveria. Five or 6 species are known; Byrnesia (which see) has been placed in this genus by the latest writer. The graptopetalums are little known in cult., but will be prized by fanciers of succulents as fast as available. **G. Orpetii** is recently described, and growing in Calif.: rosettes to about 3 in. diam., the lvs. acuminate and cuspidate, glabrous: fl.-sts. about 3 in. tall: fls. about ½ in. across, yellow marked red. Ariz.

GRAPTOPHYLLUM. *Acanthaceæ.* Shrubs with opposite often colored lvs. and red or purple tubular 2-lipped fls. in short cymes or panicles; native in Australia and Polynesia. One is grown in the greenhouse and is now a common shrub in trop. Amer. Propagated by cuttings.

hortense: *G. pictum.*

pictum (*G. hortense*). To 8 ft.: lvs. oval, to 6 in. long, entire, purplish or green marked with yellow: fls. purple or crimson, 1½ in. long, stamens exserted. New Guinea.

GRASS: see *Grasses.* **Aleppo-:** *Holcus halepensis.* **Barnyard-:** *Echinochloa Crus-galli.* **Basket-:** *Oplismenus compositus.* **Beach-:** *Ammophila.* **Beard-:** *Andropogon, Polypogon.* **Bent-:** *Agrostis.* **Bermuda-:** *Cynodon Dactylon.* **Blue-:** *Poa.* **Blue-eyed-:** *Sisyrinchium.* **Bottle-brush-:** *Hystrix patula,* **Brome-:** *Bromus.* **Canary-:** *Phalaris.* **Carpet-:** *Axonopus compressus.* **Centipede-:** *Eremochloa ophiuroides.* **Citronella-:** *Cymbopogon Nardus.* **Cloud-:** *Agrostis nebulosa.* **Colorado-:** *Panicum texanum.* **Cotton-:** *Eriophorum.* **Dune-:** *Elymus arenarius.* **Eel-:** *Vallisneria.* **Esparto-:** *Stipa tenacissima.* **Feather-:** *Stipa.* **Finger-:** *Chloris.* **Fish-:** *Cabomba caroliniana.* **Fountain-:** *Pennisetum Ruppelii.* **Guinea-:** *Panicum maximum.* **Hair-:** *Agrostis hiemalis.* **Hares-tail-:** *Lagurus ovatus.* **Herds-:** *Phleum pratense.* **Hungarian-:** *Setaria italica* var. *nigrofructa,* **Johnson-:** *Holcus halepensis.* **June-:** *Poa pratensis.* **Lawn-, Korean:** *Zoysia japonica.* **Lemon-:** *Cymbopogon citratus.* **Lyme-:** *Elymus.* **Manila-:** *Zoysia Matrella.* **Manna-:** *Glyceria.* **Mascarene-:** *Zoysia tenuifolia.* **Meadow-:** *Poa.* **Meadow-, Reed:** *Glyceria grandis.* **Means-:** *Holcus halepensis.* **Melic-:** *Melica.* **Napier-:** *Pennisetum purpureum.* **Natal-:** *Tricholæna rosea.* **Oat-, Tall:** *Arrhenatherum elatius.* **-of-Parnassus:** *Parnassia.* **Orchard-:** *Dactylis glomerata.* **Palm-:** *Setaria palmifolia.* **Pampas-:** *Cortaderia.* **Para-:** *Panicum barbinode.* **Pepper-:** *Lepidium.* **Plume-:** *Erianthus.* **Quake-:** *Bromus brizæformis.* **Quaking-:** *Briza.* **Rabbit-tail-:** *Lagurus ovatus.* **Ravenna-:** *Erianthus Ravennæ.* **Reed-:** *Phragmites communis.* **Rescue-:** *Bromus unioloides.* **Rhodes-:** *Chloris Gayana.* **Ribbon-:** *Phalaris arundinacea* var. *picta.* **Ruby-:** *Tricholæna rosea.* **Rye-:** *Lolium.* **St.-Augustine-:** *Stenotaphrum secundatum.* **Scurvy-:** *Cochlearia.* **Silk-:** *Agrostis hiemalis.* **Spear-:** *Poa alpina, Stipa.* **Spike-:** *Demazeria sicula, Leptochloa fascicularis.* **Squirrel-tail-:** *Hordeum jubatum.* **Star-:** *Aletris, Hypoxis.* **Sudan-:** *Holcus sudanensis.* **Switch-:** *Panicum virgatum.* **Tape-:** *Vallisneria.* **Tunis-:** *Holcus virgatus.* **Uva-:** *Gynerium sagittatum.* **Velvet-:** *Notholcus lanatus.* **Vernal-, Sweet:** *Anthoxanthum odoratum.* **Whitlow-:** *Draba verna.* **Winter-, Peruvian:** *Phalaris stenoptera.* **Wire-:** *Eleusine indica, Poa compressa,* **Witch-:** *Panicum capillare.* **Zebra-:** *Miscanthus sinensis* var. *zebrinus.*

GRASSES. *Gramineæ.* Horticultural grasses are the kinds grown for ornament and interest in distinction from the pasture and meadow grasses, the forage or fodder kinds, and the cereal grains. Two general purposes are served by the ornamental grasses,—the flower-garden interest, and the lawn-planting interest.

The grasses that find place in the flower-garden are mostly hardy annuals, prized for their feathery or otherwise ornamental sprays which are employed as greenery in living bouquets or dried and used in winter bouquets being prepared as are the other "everlastings" (which see). These annual grasses are grown readily from seeds, usually sown where the plants are to stand in open sunny places. Sometimes the smaller kinds are grown to maturity in pots for table decoration, the little brizas and the delicate kinds of aspris and agrostis being well adapted to the purpose. The leading annual grasses listed as ornamentals are in Agrostis, Anthoxanthum, Aspris, Avena, Brachypodium, Briza, Bromus, Chloris, Coix, Demazeria, Echinochloa, Eleusine, Eragrostis, Euchlæna, Festuca, Holcus, Hordeum, Koeleria, Lagurus, Lamarckia, Oryza, Panicum, Paspalum, Pennisetum, Phalaris, Polypogon, Scleropoa, Secale, Setaria, Syntherisma, Triticum, Zea, Zizania.

The grasses adapted to yard, landscape or border planting are mostly large-growing perennial species; and some of them also yield excellent material for dry bouquets, as the bottle-brush-grass (Hystrix), eulalia (Miscanthus), and pampas-grass. In warm countries the bamboos are commanding examples. See *Bamboo.* The perennial grasses are usually multiplied by division of the clumps or by the stolons or offsets that may arise; seeds (when procurable) should give blooming plants the second year. Important perennial grasses are Agrostis, Aira, Alopecurus, Ammophila, Ampelodesma, Anatherum, Andropogon, Anthoxanthum, Arrhenatherum, Arundinaria, Arundo, Axonopus, Bambusa, Brachypodium, Briza, Bromus, Cephalostachyum, Chloris, Chusquea, Cortaderia, Cymbopogon, Cynodon, Cynosurus, Dactylis, Dendrocalamus, Elymus, Eragrostis, Eremochloa, Erianthus, Euchlæna, Festuca, Glyceria, Gynerium, Holcus, Hordeum, Hystrix, Koeleria, Leptochloa, Lolium, Melica, Miscanthus, Molinia, Neyraudia, Notholcus, Oplismenus, Panicum, Paspalum, Pennisetum, Phalaris, Phleum, Phragmites, Phyllostachys, Poa, Saccharum, Sasa, Setaria, Stenotaphrum, Stipa, Thamnocalamus, Thysolæna, Tricholæna, Trisetum, Uniola, Zoysia.

A third class of grasses comprises the sod-forming kinds employed in the making of sward for lawns, but in this case the plants are not raised and treated separately and need not be separately listed here. See *Lawn.* The meadow and pasture grasses are of the same or similar nature and often the same species, but these kinds are not directly within the purview of this work.

A fourth set of grasses comprises the large forage kinds. These are not specially discussed in this book, although the species are entered. Important fodder and forage grasses are entered under the genera Echinochloa, Eleusine, Euchlæna, Holcus, Panicum, Pennisetum, Setaria, Zea, as well as the herbage of the small grains in the genera Avena, Hordeum, Oryza, Secale, Triticum.

A fifth group includes the cereal grains and sugar-cane, not included here beyond brief accounts of the species under their generic headings, as Avena, Holcus, Hordeum, Oryza, Saccharum, Secale, Triticum, Zea.

GRASS-NUT: *Brodiæa laxa.*

GRASSWORT, STARRY: *Cerastium arvense.*

GRATIOLA. *Scrophulariaceæ.* Herbs with opposite sessile lvs., white or pinkish fls. solitary in the axils, having entire or 2-lobed upper lip and 3-lobed lower lip, and fr. a caps.; rarely cult.

officinalis. Per. to 1 ft., with creeping rhizomes: lvs. lanceolate, toothed: fls. pink or white, with yellow throat, to ¾ in. long, pedicelled. Eu., Asia.

GREASEWOOD: *Audibertia polystachys.* In the West applied also to other plants that are not horticultural subjects and not included here.

GREENBRIER: *Smilax.*

GREENHOUSE. A glasshouse or structure in which plants are maintained or grown. Originally the word was applied to those houses in which plants are merely preserved or kept green in the winter, but this signification is now little known in America. Special types of glasshouses are the conservatory, in which plants are kept or displayed; stove or hothouse, in which plants are grown in a high temperature; the propagating pit, in which the multiplication of plants is carried forward; forcing-house in which special plants are made to yield their products far out of their natural period or sequence; and the houses of various temperatures, as cold, cool and intermediate.

GREENOVIA: see under *Sempervivum.*

GREENS. Pot-herbs are sometimes known as "greens," particularly those that come in early spring when green food is specially welcome. Such greens may be spinach, kale, dandelion, dock, pigweed and other plants grown or gathered that make acceptable eating when cooked in a pot. Accounts of the most important of these plants will be found under their appropriate alphabetic entries.

Christmas greens, or "green," are various kinds of plants that hold their foliage and color in winter and can be employed in decoration. Some of these plants are grown for the purpose, but the larger part of the durable ones are gathered from the wild including such kinds as holly, laurel, galax, smilax. The indiscriminate and destructive gathering of such wildings is to be discouraged, and other means of Christmas decoration should be developed for the large undertakings. It is more important to the education and the sentiment of the people that wild life be protected than that showy temporary public displays of this nature, of growths unrelated to plant-growing and environment, be multiplied.

GREGORIA: *Douglasia Vitaliana.*

GREIGIA. *Bromeliaceæ.* S. American terrestrial herbs with stiff lvs. in rosettes and rose-colored fls. in a simple infl. For cult. see *Bromeliaceæ;* sometimes grown for ornament and oddity.

sphacelata. To 3 ft.: lvs. spreading or recurving, spiny-margined: fls. rose, in dense axillary heads, bracts spiny. Chile.

vulcanica. St. very short: lvs. 2 ft. or more long spiny-margined, white-scaly beneath: fls. with white tube and red spreading segms., in heads to 3 in. across. Colombia.

GREVILLEA. *Proteaceæ.* Shrubs and trees with alternate lvs., bisexual fls. borne in pairs in a raceme and having long filiform showy styles, and fr. a leathery follicle; native in Australia and New Caledonia.

Grown for ornament and avenue trees in warm regions and sometimes as juvenile pot-plants in the greenhouse. Propagated by seeds.

Banksii. Shrub or tree to 20 ft.: lvs. with 3–11 linear or lanceolate segms. to 4 in. long, margins revolute, silky-tomentose beneath: fls. red, in dense terminal secund racemes to 4 in. long. Queensland. Vars. **alba** and **Forsteri** are listed.

bipinnatifida. Shrub to 4 ft., sometimes prostrate: lvs. to 4 in. long, pinnately cut into 9–21 oblong or pinnatifid segms.: fls. red, in loose secund racemes to 4 in. long, sometimes panicled. W. Australia.

crithmifolia. Shrub to 4 ft.: lvs. to 1 in. long, pinnately cut into 3–5 narrow-linear segms.: fls. in short dense sessile racemes. W. Australia.

Endlicheriana. Shrub to 7 ft.: lvs. linear, to 4 in. long, silvery-pubescent on both sides: fls. in dense racemes to ¾ in. long, said to be mauve. W. Australia.

eriostachya. Shrub to 6 ft.: lvs. narrow-linear, to 8 in. long, usually pinnately cut into 3–5 segms.: fls. in dense secund terminal tomentose racemes to 6 in. long. W. Australia.

Hilliana. Tree to 60 ft.: lvs. entire, deeply divided at end into 2 or 3 lobes, or pinnatifid into 5–7 lobes, to 1 ft. long, silvery-pubescent beneath: fls. red varying to pink and white, in dense cylindrical axillary racemes to 8 in. long. Queensland, New S. Wales.

juniperina (*G. sulphurea*). Small shrub: lvs. spreading, linear, stiff and pungent-pointed, to 1 in. long, margins revolute, silky-pubescent beneath: fls. pale yellow or tinged with red, in very short sessile racemes. New S. Wales.

leucopteris. Shrub to 8 ft.: lvs. 1 ft. or more long, pinnate into narrow-linear segms. to 10 in. long, tomentose beneath: fls. in loose many-fld. panicled racemes to 4 in. long, said to be white. W. Australia.

obtusifolia. Spreading or procumbent much branched shrub: lvs. oblong-linear, margins revolute, rusty-pubescent beneath: fls. in short loose secund racemes. W. Australia.

oleoides. Shrub: lvs. linear or lanceolate, to 4 in. long, margins recurved, tomentose beneath: fls. bright red, in short nearly sessile racemes. New S. Wales, Victoria.

ornithopoda. Glabrous shrub: lvs. to 3½ in. long, divided into 3 lanceolate lobes: fls. small, in short axillary racemes, said to be white. W. Australia.

paniculata. Shrub to 8 ft.: lvs. 1–2-divided into 3 terete pungent-pointed segms.: fls. small, in axillary short racemes. N. Australia.

polybotrya. Tall shrub: lvs. oblong or oblong-lanceolate, to 1½ in. long: fls. in dense cylindrical panicled racemes or spikes to 2 in. long. N. and W. Australia.

punicea. Small shrub: lvs. oblong or nearly oval, to 2 in. long, margins recurved, tomentose beneath: fls. bright red, in short dense racemes. New S. Wales.

robusta. SILK-OAK. Tree to 150 ft. but sometimes grown as a decorative pot and florists plant: lvs. fern-like, 2-pinnate into lanceolate entire or lobed segms. with recurved margins: fls. orange, in secund racemes to 4 in. long on short leafless branches. Queensland, New S. Wales.—Formerly much grown from seeds in pots under glass as a decorative subject.

rosmarinifolia. Shrub to 6 ft.: lvs. linear, to 1½ in. long, margins revolute, silky-pubescent beneath: fls. reddish, in short dense sessile racemes. New S. Wales.

sulphurea: *G. juniperina.*

Thelemanniana. Shrub to 5 ft.: lvs. to 2 in. long, divided into many linear segms.: fls. pink tipped with green, in secund terminal racemes to 1½ in. long. S. and W. Australia.

Wilsoni. Glabrous shrub to 5 ft.: lvs. 2–3-ternately divided into linear stiff pungent-pointed segms. to 1 in. long: fls. in loose racemes. W. Australia.

GREWIA. *Tiliaceæ.* Trees and shrubs native to warm regions in the Old World, with alternate simple lvs., small fls. solitary or cymose, and fr. a drupe; sometimes planted for ornament.

caffra. Shrub or small tree: lvs. oblong, to 3 in. long, finely toothed: fls. purple. S. Afr.; grown in S. Calif. and similar regions.

occidentalis. Shrub: lvs. ovate, to 2 in. long, toothed: fls. purple. S. Afr.; to be grown in mild climates.

parviflora. Shrub to 8 ft.: lvs. ovate, to 5 in. long, toothed: fls. pale yellow. China, Korea; stands in S. New England.

GREYIA. *Melianthaceæ.* Small S. African trees and shrubs with alternate simple lvs., showy fls. in axillary racemes, and fr. a leathery caps.; one showy species is planted for ornament in the S. and Calif. or sometimes under glass. Propagated by seeds or cuttings of half-ripened wood.

Sutherlandii. Small tree but blooming as a little bush: lvs. orbicular to oblong, to 3 in. long, heart-shaped at base, coarsely and irregularly toothed: fls. bright scarlet, petals about ½ in. long, in dense racemes to 10 in. long, the showy stamens long-exserted.

GRINDELIA. Gum-Plant. *Compositæ.* Coarse per. herbs native in W. N. Amer., with alternate lvs. and rather large solitary heads (usually gummy) of yellow ray- and disk-fls.; pappus of deciduous awns or bristles.

Sometimes grown for ornament in the regions where they grow, succeeding on poor land. Propagated by division, cuttings or seed.

integrifolia. To 3 ft.: lvs. spatulate to lanceolate, basal to 1 ft. long, entire or toothed: heads to 2½ in. across. B. C. to Ore.

latifolia: *G. robusta* var.

nana. To 1½ ft.: lvs. oblanceolate, to 2½ in. long: heads to ⅓ in. across. Wash. to Wyo. and Calif.

robusta. To 2 ft.: lvs. ovate to lanceolate, to 2 in. long, toothed: heads 1½ in. across, involucre with conspicuous leafy bracts. Calif. Var. **latifolia** (*G. latifolia*) has larger clasping lvs.

GRISELINIA. *Cornaceæ.* Evergreen shrubs or trees native in New Zeal. and Chile, allied to Aucuba, with alternate leathery shining lvs., small diœcious fls. in panicles or racemes, and fr. a berry; grown out-of-doors in Calif.

littoralis. To 50 ft.: lvs. ovate or oblong-ovate, to 4 in. long: panicles to 3 in. long. New Zeal. Var. **variegata** is listed.

lucida. To 25 ft.: lvs. ovate or oblong, to 7 in. long, very unequal at base: panicles to 6 in. long, the pistillate fls. without petals. New Zeal.

GRISLEA: *Combretum coccineum.*

GROMWELL: *Lithospermum.* **False:** *Onosmodium.*

GROSSULARIA: *Ribes.*

GROUND-CEDAR: *Lycopodium complanatum.* **-Cover:** see *Lawn.* **-Pine:** *Lycopodium obscurum.* **-Pink:** *Phlox subulata.*

GROUNDNUT: *Apios tuberosa, Arachis hypogæa, Panax trifolium.*

GROUNDSEL: *Senecio.* **-Bush:** *Baccharis halimifolia.* **Giant:** *Ligularia Wilsoniana.*

GRUGRU: *Acrocomia aculeata.*

GRUMIXAMEIRA-TREE: *Eugenia Dombeyi.*

GUABA: *Inga vera.*

GUAIACUM. Lignum-Vitæ. *Zygophyllaceæ.* A half dozen trop. American trees and shrubs with very hard resinous wood, pinnate lvs. and small blue or purple fls., fr. a strongly angled caps.; sometimes planted for ornament and interest in S. Calif. and S. Fla. One species natively reaches the keys of Fla.

guatemalense. Small tree to 16 ft.: lfts. 4–6 pairs, linear-oblong: fls. before the lvs., several together from the axils, azure-blue, petals glabrous: fr. reddish or orange, obovate, about ½ in. or more long. Guatemala.

officinale. Tree to 15 or 30 ft.: lfts. 2–3 pairs, to 2 in. long, oval to broad-obovate: fls. blue or rarely white, ½ in. long, in clusters at ends of twigs, petals slightly tomentose at least at tip: fr. yellow, broadly obcordate or unequal-sided, to ¾ in. long. W. Indies, N. S. Amer.

GUAMA: *Inga laurina.*

GUANABANA: *Annona muricata.*

GUAVA: *Psidium.* **Chilean:** *Myrtus Ugni.*

GUAYMOCHIL: *Pithecellobium dulce.*

GUAYULE: *Parthenium argentatum.*

GUEVINA: *Gevuina.*

GUILANDINA: *Cæsalpinia Crista.*

GUILIELMA. *Palmaceæ.* Probably 3 species in trop. Amer., of monœcious spiny feather-palms, allied to Bactris: tall, cespitose or trunk solitary, ringed, gray, very spiny: petiole and rachis spiny: spadix from lowermost axils or just beneath the crown, the peduncle spiny; fls. thickish, the staminate (stamens 6) and pistillate intermixed but ends of branches staminate: fr. ovoid, oblong or ovoid-conic, drupe-like with edible flesh; seed 1. For cult. see *Palm.*

Gasipaes (*Bactris Gasipaes. G. speciosa. G. utilis* is probably the same). Pejibaye or Gachipaes. An important fruit-tree in Cent. and S. Amer., known under many vernacular names: trunks mostly few or several, sometimes single, to 60 ft., carrying attractive crown of arching-drooping foliage: lvs. 8–12 ft. long, deep green above, somewhat lighter underneath; pinnæ many, strongly ribbed, bifid at apex, setose on ribs and margins: fr. 1–2 in. long, ovoid to inverted top-shaped, yellow, orange, brownish-red, in heavy hanging clusters, of superior quality; a seedless form is known. Little known in U. S.

speciosa: *G. Gasipaes.*

utilis: see *G. Gasipaes.*

GUINEA-HEN WEED: *Petiveria alliacea.*

GUIZOTIA. *Compositæ.* Trop. African herbs with opposite sessile lvs. and yellow heads of ray- and disk-fls., solitary or clustered; pappus none. One species is sometimes cult. for the seeds, which yield oil.

abyssinica (*G. oleifera*). Ann. to 5 ft.: lvs. lanceolate, to 9 in. long, toothed: heads ¾ in. across, in corymbs.

oleifera: *G. abyssinica.*

GUM: *Nyssa.* **Arabic Tree:** *Acacia arabica.* **-Plant:** *Grindelia.* **Sweet:** *Liquidambar Styraciflua.* **-Tree:** *Eucalyptus.*

GUMBO: see *Okra.*

GUMI: *Elæagnus multiflora.*

GUNNERA. *Haloragidaceæ.* Per. herbs with creeping rhizomes, radical lvs., small mostly unisexual fls. in spikes or panicles, and drupaceous frs.

Some of the kinds are grown for the bold foliage effects of large clumps. Rich moist soil is necessary, and preferably a sunny position. Winter protection should be provided, and they are not hardy in the North. Propagated by division and seed.

chilensis (*G. scabra*). Lvs. palmately lobed and cut, to 6 ft. across, the fleshy petiole to 6 ft. long and covered with stiff hairs: fls. in spikes to 3 ft. high: fr. red. Chile, Ecuador, Colombia.

manicata. Differs chiefly in the lvs. being peltate and the petiole covered with reddish spiny hairs. S. Brazil.

scabra: *G. chilensis.*

GUTENBERGIA: *Erlangea cordifolia.*

GUTTA-PERCHA: *Palaquium;* also other plants not mentioned in this book.

GUTTIFERÆ (incl. *Clusiaceæ*). Garcinia Family. Woody plants in the tropics of both hemispheres, a few of which are planted in our southernmost parts: lvs. mostly opposite or whorled and simple, often thick and mostly evergreen: fls. regular, polypetalous, sometimes bisexual but plants for the most part diœcious or polygamous, solitary or cymose, the stamens prevailingly many and distinct or somewhat united: fr. drupe-like, berry-like or sometimes capsular, 2-celled or more, the styles more or less united. Hypericaceæ is sometimes united with this family. With us the genera Calophyllum, Garcinia and Mammea are planted.

GUZMANIA. *Bromeliaceæ.* Trop. American terrestrial or epiphytic herbs with stiff lvs. in basal rosettes and yellow or white fls. in spikes borne amongst the lvs., often showily bracted; grown under glass. Cult. as for *Bromelia* and *Tillandsia.*

lingulata. Epiphytic with stout st.: lvs. to 1½ ft. long and 1 in. wide: fls. with yellowish tube and purplish limb, in dense drooping heads, the bracts red. Trop. Amer.

musaica. Terrestrial, rarely epiphytic, stemless: lvs. to 20 in. long and 3 in. wide, transversely lined above with dark green and beneath with purple: fls. yellowish, the bracts golden-yellow striped with rose. Colombia.

GYMNADENIA: *Habenaria.*

GYMNADENIOPSIS: *Habenaria.*

GYMNOCALYCIUM. *Cactaceæ.* A genus of the Echinocactus subtribe, of more than a score of S. American species, known by the naked axils of scales on ovary and fr., ribs usually broad and tubercled, spines stout and mostly awl-like, fls. white, yellow or pink, with a definite but short tube and borne from upper areoles: plant simple or cespitose, mostly globular. Cult. as for Echinocactus. See *Cacti.*

denudatum (*Echinocactus denudatus*). Somewhat globose or depressed, to 6 in. diam., ribs 5–8, spines 5 or 8 and all radial, appressed: fls. white or pale rose. S. Brazil to Argentina.

gibbosum (*Echinocactus gibbosus*). Usually taller than broad, to 8 in. high, but sometimes depressed, ribs 12–14, spines 7–12 and all radial: fls. white to pinkish, something over 2 in. long. Argentina.

Mostii (*Echinocactus Mostii*). Depressed-globose, 2 in. or more high and about twice as thick, ribs 11–14, radials 7–9, central solitary, all brownish: fls. bell-shaped, pale red, to 3 in. long. Argentina.

multiflorum (*Echinocactus multiflorus*). Simple or cespitose, depressed to globular to short-columnar, 3½ in. or more high, ribs 10–15, spines 7–10 and all radial: fls. about 1½ in. long, pinkish to nearly white. Brazil to Argentina.

Schickendantzii (*Echinocactus Schickendantzii*). Usually simple and sometimes depressed, to 4 in. diam., ribs mostly 7, spines 6 or 7 and all radial: fls. white or pinkish, 2 in. long. Argentina.

GYMNOCLADUS. *Leguminosæ.* Two deciduous trees, one from E. Asia and the cult. species native in E. N. Amer. from N. Y. south. **G. dioica** (*G. canadensis*). KENTUCKY COFFEE-TREE. To 100 ft.: lvs. bipinnate, the lfts. ovate: fls. regular, greenish-white, the racemes of the pistillate tree to 1 ft. long and of the staminate to 4 in.: pods to 10 in. long, red-brown. Var. **variegata** has variegated foliage.—Propagated by seeds and cuttings.

GYMNOGRAMMA: *Pityrogramma;* also *Coniogramme japonica.*

GYMNOSPERMS: *Conifers, Cycads, Ginkgoaceæ, Pinaceæ, Taxaceæ.*

GYMNOSPORIA. *Celastraceæ.* Trees and shrubs bearing alternate simple leathery lvs., small greenish or yellowish fls. in axillary cymes, and capsular frs.; a few species may be planted in warm regions. Propagated by seeds and cuttings.

cassinoides (*Catha* and *Celastrus cassinoides*). Erect glabrous evergreen shrub: lvs. ovate, acute, serrate: pedicels very short, 2 or 3 in the axils; fls. white. Canary Isls.

serrata. Evergreen shrub to 6 ft. or more, sometimes spiny: lvs. ovate to oblanceolate, finely toothed, to 3 in. long: fls. whitish. Abyssinia.

GYMNOTHRIX: *Pennisetum.*

GYNANDROPSIS (*Pedicellaria*). *Capparidaceæ.* Cleome-like herbs, differing in the fact that the torus is prolonged beyond the insertion of petals and sepals into a stem-like part or androphore on which the stamens are borne, making a peduncle-like base for the gynophore (or pistil-bearing extension). Native in warm parts of the world, one of them sometimes cult. as a Cleome and by some authors referred to that genus.

speciosa (*Cleome speciosa*). Ann. to 2 ft. or more, grown for ornament in warm countries: very like *Cleome spinosa* but glabrous or at least not glandular and not spiny, the androphore ¼–⅓ in. long and beyond the insertion of stamens the very long gynophore projects: petals pink or white. Mex., Cent. Amer.

GYNERIUM. *Gramineæ.* Tall per. grasses with long flat lvs. and diœcious spikelets borne in large terminal plume-like panicles; differs from Cortaderia, the true pampas-grasses, in technical characters of the florets; native in trop. Amer. One is sometimes planted for ornament in warm countries. See *Grasses.*

argenteum: *Cortaderia Selloana.*

jubatum: *Cortaderia rudiuscula.*

saccharoides: *G. sagittatum.*

sagittatum (*G. saccharoides*). UVA-GRASS. To 40 ft.: lvs. to 6 in. long and 3 in. wide, edges finely toothed: panicles to 3 ft. long, the branches drooping, pistillate very silky. Trop. Amer.

GYNOPOGON: *Alyxia.*

GYNURA (*Crassocephalum*). *Compositæ.* Trop. herbs or rarely subshrubs with alternate entire or lobed lvs., solitary or clustered heads of disk-fls. and not very showy; pappus of white bristles.

Gynuras are grown under glass as foliage plants. They need plenty of light to bring out the color in the foliage; the soil and moisture requirements are similar to those for coleus or geraniums. They are easily grown from cuttings of growing shoots, also from seeds if obtainable.

aurantiaca. VELVET-PLANT. Stout, branching, to 3 ft., densely velvety with violet or purple hairs: lvs. ovate, jagged-toothed: heads to ¾ in. across, in loose terminal clusters, yellow or orange. Java; escaping in warm regions.

GYPSOPHILA. *Caryophyllaceæ.* Hardy ann. and per. herbs, very branching or spreading, slender, with scant foliage when in bloom: fls. small and numerous, axillary or paniculate, rosy or white; native in Eu., Asia and N. Afr.

A few species are grown for the dainty mist-like effects in rock-gardens, in the border, and as trimming in bouquets. Propagated by seeds, division and sometimes by cuttings.

acutifolia. Per., tall and much branched, the infl. glandular: lvs. narrow-lanceolate and acute, to 5 in. long and 1 in. or more broad, obscurely 3-nerved: fls. larger than in *G. paniculata*, white. Caucasus.

alpigena: listed name.

altissima. Per. to 2 ft.: lvs. to 3 in. long and ¼ in. wide: fls. white, in many-fld. panicles. E. Eu. to Cent. Asia.

cerastioides. MOUSE-EAR G. Per., downy, creeping, to about 4 in. high: lvs. obovate, soft-hairy on both sides: fls. to ⅔ in. across, white with pink veins. Himalayas.

collina. Subshrubby, to 1 ft. or more: lvs. linear, rather fleshy: fls. white or pink, in panicles. E. Eu.

Ehrlei: a double-fld. form of *G. paniculata*.

elegans. Ann. to 1½ ft., with upright forking sts.: lvs. lanceolate: fls. white or rosy, ¼ in. or more across. Caucasus. Color vars. are **rosea**, **alba grandiflora** and **carminea**.—Good bouquet plant; grown somewhat under glass.

fratensis: hort. name for a pink-fld. creeping form to 3 in. high.

libanotica. Per. to 1 ft., much branched, glaucous: lvs. stiff and fleshy, about ½ in. long and ⅙ in. wide: fls. pink. Asia Minor.

Manginii. Per., roots thick, fleshy: lvs. smooth, glaucous: fls. rather large, light rose, in small panicles. Siberia.

muralis. Ann., diffusely branched, to 1 ft.: lvs. very small and narrow: fls. solitary, axillary, rosy. Eu.; adventive in E. U. S.

paniculata. BABYS-BREATH. Per. with large root, diffusely branched, to 3 ft. or more, glaucous: lvs. linear-lanceolate, to 4 in. long and ⅜ in. broad, sharp-pointed: fls. white, in loose panicles. Eu., N. Asia; escaped in N. Amer. Var. **flore-pleno** has double fls. See *Galium Mollugo*.

perfoliata (*G. scorzonerifolia*). Per., tall, usually smooth but sometimes hairy near top: lvs. perfoliate: fls. purplish. Medit. region.

prostrata: *G. repens*.

repens (*G. prostrata*). Per. to 6 in., trailing or prostrate, not glaucous: lvs. linear: fls. white or rosy, in few-fld. panicles. Alps and Pyrenees. Var. **monstrosa** is larger and var. **rosea** has rose fls.

scorzonerifolia: *G. perfoliata*.

Steveni. Per. to 1 ft., somewhat glaucous: lvs. linear, keeled: fls. white. Caucasus.

Sundermanni: listed name.

transsylvanica. Erect: lvs. linear, keeled: fls. in clusters, with colored calyx. E. Eu.

trichotoma. Erect, glaucous: lvs. broad-oblong: fls. very small, in branching panicles. Asia Minor.

H

HABENARIA. Rein or Fringed Orchis. *Orchidaceæ.* Terrestrial orchids with tuberous roots and leafy sts. and fls. of various sizes and colors in terminal racemes or spikes, two petals usually smaller than the sepals, the lip entire or lobed or fringed and spurred at base; grown in bog-gardens or moist places out-of-doors. There are various interpretations of the genus, resulting in several generic names. See *Orchids.*

blephariglottis. White Fringed O. To 2½ ft.: lvs. to 8 in. long and ¾ in. wide: fls. pure white, the lip and petals fringed, July–Aug. Newf. to Fla. and Miss.

bracteata (*H. viridis* var. *bracteata. Cœloglossum bracteatum*). Satyr O. To 2 ft.: lvs. to 5 in. long: fls. greenish with white spur, in spikes to 5 in. long, May–Sept. N. N. Amer., Eu.

ciliaris (*Blephariglottis* and *Platanthera ciliaris*). Yellow Fringed O. To 2½ ft.: lvs. to 8 in. long and ¾ in. wide: fls. orange or yellow, the petals and lip fringed, the spur to 1½ in. long, in spikes to 6 in. long, July–Aug. Vt. to Fla. and Tex.

clavellata (*Gymnadeniopsis clavellata*). Club-spur O. To 1½ ft.: lvs. to 6 in. long: fls. greenish or whitish, in spikes to 2 in. long, July–Aug. Newf. to Fla. and La.

conopsea (*Gymnadenia conopsea*). Fragrant O. To 1½ ft.: lvs. linear: fls. rose or violet-purple, fragrant, May–June. Eu., N. Asia.

dilatata (*Limnorchis* and *Platanthera dilatata*). White Bog O. To 2 ft.: lvs. to 1 ft. long and ½ in. wide: fls. white, the spur about as long as the entire lip, in 10–20-fld. racemes, June–Sept. N. N. Amer.

fimbriata (*Blephariglottis grandiflora. Platanthera fimbriata*). Large Purple Fringed O. To 5 ft.: lvs. to 10 in. long and 3 in. wide: fls. lilac or rarely white, fragrant, the lip fringed to about middle, June–Aug. Newf. to N. C.

flava (*Perularia flava*). To 2 ft.: lvs. to 1 ft. long and 3 in. wide: fls. with greenish petals and greenish-yellow sepals, in spikes to 6 in. long, June–July. N. S. to Fla. and La.

Hookeri (*Lysias Hookeriana*). To 15 in., with 2 basal oval lvs. to 5½ in. long: fls. yellowish-green, the spur about ⅓ in. long, June–Sept. N. S. to Pa. and Ia.

hyperborea (*Limnorchis hyperborea*). Northern Green O. To 3 ft.: lvs. to 1 ft. long and ¾ in. wide: fls. greenish, the spur about as long as lip, May–Aug. N. N. Amer.

lacera (*Blephariglottis lacera*). Ragged or Green Fringed O. To 2 ft.: lvs. to 8 in. long and 1½ in. wide: fls. greenish-yellow, lip deeply fringed, spur ⅔ in. long, June–July. Newf. to Ga. and Ark.

odoratissima (*Gymnadenia odoratissima*). Small Fragrant O. Similar to *H. conopsea* but much smaller, with deep red-purple fls. Eu.

psycodes (*Blephariglottis* and *Platanthera psycodes*). Small Purple Fringed O. To 3 ft.: lvs. to 10 in. long and 3 in. wide: fls. lilac or rarely white, fragrant, the lip fringed, the spur about ⅓ in. long, July–Aug. Newf. to N. C. and Tenn.

HABERLEA. *Gesneriaceæ.* A few herbaceous tufted perennials with basal lvs. and nodding tubular irregularly 5-lobed fls. borne on scapes; native in the Balkans.

Ferdinandi-Coburgii. Differs from *H. rhodopensis* in smaller size, lvs. glabrous above, smaller dark blue fls. with upper lip twice as broad as long.

rhodopensis. To 6 in., soft-hairy: lvs. obovate- or ovate-oblong, to 3 in. long, coarsely toothed, thick: fls. pale lilac, 1 in. long and broad.

HABROTHAMNUS: *Cestrum elegans* and *fasciculatum.*

HACKBERRY: *Celtis.*

HACKMATACK: *Larix laricina.*

HACQUETIA. *Umbelliferæ.* One European per. herb sometimes grown in the rock-garden and propagated by division. **H. Epipactis.** To 8 in.: lvs. basal, deeply palmately lobed: fls. yellow, polygamous, in short-stalked umbels subtended by large involucral lvs., Apr.–May.

HÆMANTHUS. Blood-Lily. *Amaryllidaceæ.* African low bulbous herbs with broad basal lvs. and red or white fls. in dense heads terminating the solid scape, the perianth-tube short; grown for the summer and autumn bloom.

The plants should have a night temperature of 50–55°. Bulbs should be rested over winter and started into growth in spring. Propagated by offsets.

albiflos. To 1 ft.: lvs. thick and fleshy, to 8 in. long and 4 in. wide, ciliate on edges: fls. white, ¾ in. long, in heads 2 in. across. S. Afr.

coccineus. To 10 in.: lvs. thick and fleshy, to 2 ft. long and 8 in. broad: fls. red, 1 in. long, in heads to 3 in. across. S. Afr.

Katharinæ. To 1 ft.: lvs. thin, to 14 in. long and 6 in. broad: fls. bright red, 2½ in. long, in heads to 9 in. across. S. Afr.

puniceus. To 15 in.: lvs. thin, to 1 ft. long and 4 in. wide: fls. pale scarlet to white, 1 in. long, in heads to 4 in. across. S. Afr.

HÆMARIA. *Orchidaceæ.* Terrestrial orchids with creeping rootstocks, basal lvs., and fls. in spikes, the lip with wide claw and pouch-like sac at base; grown for the attractive foliage. For cult. see *Orchids.*

discolor. Lvs. to 3 in. long and 1 in. wide, dark green above and bright purple beneath: fls. Sept.–Dec. Singapore to S. China. Var. **Dawsoniana** (*Goodyera Dawsoniana*) has larger lvs. veined with red.

HÆMATOXYLUM. *Leguminosæ.* One species is employed for the heartwood which is used in making dyes and for medicinal purposes; sometimes planted in warm countries for ornament. **H. campechianum,** Logwood, Bloodwood Tree, is a tree to 45 ft. high, with pinnate lvs. of 2–4 pairs of obovate usually emarginate lfts. to 1 in. long, bright yellow fragrant fls. in axillary racemes, and flat pods narrowed at both ends, to 1¼ in. long. Cent. Amer. and W. Indies.—Propagated by seeds.

HAKEA. *Proteaceæ.* Australian evergreen shrubs with alternate lvs., bisexual fls. borne in pairs in short axillary racemes or clusters, and woody capsular frs.; differs from Grevillea chiefly in the long terminal wings on the seeds.

Hakeas are grown out-of-doors in southern United States and withstand slight frost. They are drought-resistant and do best in light well-drained soil. Propagated by seeds in winter or early spring and the seedlings kept in boxes for the first year. As the capsules are very hard, they must be dried for some time before discharging the seeds. Hakeas may also be propagated by cuttings. Well adapted to California.

acicularis (*H. sericea*). Tall shrub, similar to *H. gibbosa* but with nearly glabrous instead of hairy branchlets, and differing from *H. pugioniformis* in the glabrous perianth. New S. Wales, Victoria, Tasmania.

auriculata. Shrub to 2 ft. or more: lvs. cuneate, to 3 in. long, prickly-toothed or -lobed, auriculate at base: fls. in clusters. W. Australia.

cristata. Shrub to 8 ft.: lvs. broad-obovate to oblong, to 3 in. long, prickly-toothed, stiff and glaucous: fls. white, in short racemes. W. Australia.

cucullata. Shrub to 14 ft.: lvs. cordate-orbicular, to 4 in. across, entire or prickly-toothed, sessile, stiff: fls. in clusters. W. Australia.

dactyloides. Tall shrub: lvs. linear- or oblong-lanceolate, to 4 in. long, prominently 3-nerved, stiff: fls. numerous. New S. Wales.

elliptica. Shrub to 10 ft.: lvs. oval, to 4 in. long and 2 in. wide, parallel-veined, wavy-margined, rusty-pubescent when young: fls. white, in sessile clusters. W. Australia.

erinacea. Shrub to 3 ft.: lvs. to 1 in. long, of 3–5 cylindrical stiff segms. which are entire or divided: fls. in sessile clusters. W. Australia.

eucalyptoides: *H. laurina.*

gibbosa. Shrub to 10 ft.: lvs. needle-like, to 3 in. long, entire, stiff and spiny-tipped: fls. white, in sessile clusters. New S. Wales, Victoria.

glabella. Shrub to 15 ft.: lvs. obovate or oblong, to 3 in. long, usually prickly-toothed, auriculate at base: fls. white. W. Australia.

ilicifolia: *H. varia.*

incrassata. Shrub to 3 ft.: lvs. linear-lanceolate or oblong-linear, to 2 in. long, entire, thick: fls. in sessile clusters. W. Australia.

laurina (*H. eucalyptoides*). Sea Urchin. Shrub or tree to 30 ft.: lvs. lanceolate or narrow elliptic, to 6 in. long and 1 in. wide, parallel-veined, entire: fls. crimson, in sessile globose clusters, with long yellow styles. W. Australia.

marginata. Shrub to 8 ft.: lvs. lanceolate, to 1½ in. long, with prominent midrib and margins, thick and stiff. W. Australia.

multilineata. Tall shrub: lvs. linear-lanceolate to oblong, to 8 in, long, with many small nerves, pubescent, thick: fls. in spike-like racemes to 3 in. long. S. and W. Australia.

pectinata: *H. suaveolens.*

platysperma. Lvs. cylindrical, to 5 in. long, thick and stiff: fls. in sessile clusters. W. Australia.

propinqua. Tall shrub: lvs. needle-like, to 1½ in. long, rather thick and smooth, crowded: fls. very small, clustered. New S. Wales.

pugioniformis. Shrub to 8 ft.: lvs. needle-like, to 2 in. long, stiff and spiny-tipped: fls. white, in sessile clusters, the styles long, differing from *H. gibbosa* in the pubescent perianth. New S. Wales, Victoria, Tasmania.

ruscifolia. Shrub to 8 ft.: lvs. ovate-oblong to lanceolate, to 1 in. long, entire and spiny-tipped: fls. white, small, in dense clusters. W. Australia.

saligna. Shrub to 8 ft.: lvs. oblong or lanceolate, to 6 in. long, entire, pale or grayish-green: fls. white, small, in dense clusters, the styles long. Queensland, New S. Wales.

sericea: *H. acicularis.*

suaveolens (*H. pectinata*). Shrub to 10 ft.: lvs. needle-like, to 4 in. long, usually branched into stiff spiny-tipped segms.: fls. white, fragrant, in dense racemes. W. Australia.

trifurcata. Shrub to 10 ft., much branched: lvs. cylindrical, to 3 in. long, divided into 3 segms., stiff; sometimes with few flat oblong lvs.: fls. in sessile clusters. W. Australia.

varia (*H. ilicifolia*). Shrub to 8 ft.: lvs. to 2 in. long, prickly lobed or pinnatifid: fls. small, in clusters. W. Australia.

HALERPESTES: *Ranunculus Cymbalaria.*

HALESIA (*Mohrodendron*). Silver-Bell. Snowdrop-Tree. *Styracaceæ.* Attractive deciduous shrubs or trees with alternate toothed lvs., white bell-shaped drooping fls. in axillary clusters on branchlets of previous year in spring, and fr. a dry winged drupe.

Only *H. carolina* and *H. monticola* are hardy North. The species prefer rich well-drained soil with some shelter. They transplant readily. Propagated by seed as soon as ripe or stratified, by layers, root-cuttings or cuttings of green wood from forced plants.

carolina (*H. tetraptera*). To 40 ft.: lvs. ovate to ovate-oblong, to 4 in. long: fls. to ¾ in. long, with shallow corolla-lobes: fr. 4-winged, to 1½ in. long. W. Va. to Fla. and Tex. Var. **Meehani** has smaller wrinkled lvs. and smaller fls.

diptera. To 30 ft.: lvs. oval or obovate, to 5 in. long: fls. 1 in. long, corolla deeply lobed: fr. 2-winged, to 2 in. long. S. C. to Fla. and Tex.

hispida: *Pterostyrax hispida.*

monticola. To 100 ft.: lvs. oval or oblong, to 11 in. long: fls. to 1 in. long, with shallow corolla-lobes: fr. 4-winged, 2 in. long. N. C. to Ga. and Tenn.

tetraptera: *H. carolina.*

HALIMODENDRON. Salt Tree. *Leguminosæ.* One deciduous ornamental shrub from salty plains of Cent. Asia. **H. halodendron** (*H. argenteum*). To 6 ft.: lvs. of 2–4 oblanceolate lfts. to 1½ in. long, the petiole becoming spiny: fls. papilionaceous, pale purple, in lateral 2–3-fld. racemes: pods inflated, to 1 in. long.—Hardy N.; propagated by seeds, layers, cuttings over bottom heat, or by grafting on laburnum or caragana.

HALORAGIDACEÆ. Water Milfoil Family. Widely distributed herbs, mostly aquatic, of about 8 genera, of which Gunnera and Myriophyllum are grown for the ornamental foliage and habit. The family is very diverse in character of lvs., has regular often very small bisexual or unisexual fls., the calyx with 2–4 lobes, 2–4 separate petals or none, 1–8 stamens, inferior 1–4-celled ovary, and fr. a small nut or drupe. Three genera are represented by native species in N. E. U. S. and many of them are in the southern hemisphere.

HAMAMELIDACEÆ. Witch-Hazel Family. Shrubs and trees of about 20 genera mostly in warm temp. regions, evergreen or deciduous: lvs. alternate, simple: fls. bisexual or unisexual, in heads or racemes, with 4–5 sepals and separate petals, or petals lacking, 4 or more stamens, and 2-celled ovary: fr. a 2-beaked woody caps. The family contains many ornamental genera, as Corylopsis, Distylium, Fothergilla, Hamamelis, Liquidambar, Loropetalum, Parrotia, Parrotiopsis, most of them hardy N.

HAMAMELIS. Witch-Hazel. *Hamamelidaceæ.* Deciduous small trees or shrubs with simple toothed lvs., yellow fls. in axillary nearly or quite sessile clusters blooming in autumn or very early spring, and capsular frs. ripening in the late season or autumn following; native in N. Amer. and E. Asia and hardy N.; sometimes planted for ornament and screens.

They thrive mostly in rather moist soil. Propagated by seeds which require two years to germinate, by layers, or by grafting on stock of *H. virginiana*.

arborea: *H. japonica* var.

japonica. To 30 ft.: lvs. to 4 in. long, becoming glabrous beneath: fls. to ¾ in. long, Jan.–Mar. Japan. Var. **arborea** (*H. arborea*) has larger lvs. and calyx deep purple inside. Var. **Zuccariniana** is tree-like, with calyx greenish-yellow inside.

mollis. To 30 ft.: lvs. to 6 in. long, gray-tomentose beneath: fls. to ¾ in. long, Jan.–Mar., the calyx red inside. China.

vernalis. To 6 ft., bearing suckers: lvs. to 5 in. long, nearly glabrous beneath: fls. to ½ in. long, Jan.–Mar., calyx dark red inside. Mo. to La. and Okla.

virginiana. To 15 ft.: lvs. to 6 in. long, pubescent only on veins beneath: fls. to ¾ in. long, Sept.–Oct., calyx brownish-yellow inside. E. N. Amer. to Tex. —A tenacious common coarse bush, very attractive for its late autumn bloom.

HAMATOCACTUS. *Cactaceæ.* One species, known from Echinocactus by its thin ribs, funnelform fl. and naked axils of fl.-scales, small red berry and tuberculated seeds. See *Cacti.* **H. setispinus** (*Echinocactus setispinus*). Globose to short-cylindric, to 6 in. high, ribs commonly 13, radial spines 12–16 and slender, centrals longer and 1–3: fls. yellow, between 2 and 3 in. long, tube not longer than limb, scales fimbriate. S. Tex., Mex.

HAMELIA. *Rubiaceæ.* Evergreen shrubs native in warm parts of Amer., with opposite or whorled entire lvs., tubular 5-lobed red or yellow fls. in terminal branching cymes, and fr. a small berry.

A few species are grown out-of-doors in southernmost United States. Propagated by seeds and cuttings of half ripe wood under glass.

erecta (*H. patens*). SCARLET-BUSH. To 25 ft., gray-pubescent: lvs. oval or ovate, to 6 in. long: fls. scarlet or orange, to ¾ in. long: fr. dark red or purple, ¼ in. long, ovoid. Fla. to Brazil.—It has been confused in cult. with Ixora.

patens: *H. erecta.*

sphærocarpa. To 12 ft., hairy: lvs. oblong, to 4 in. long, undulate: fls. orange-yellow, 1 in. long: fr. purplish-black, globose. Peru.

HAMOSA: *Astragalus austrinus.*

HARBINGER-OF-SPRING: *Erigenia bulbosa.*

HARBOURIA. *Umbelliferæ.* One per. herb with ternately decompound lvs., small yellow fls. in long-stalked umbels, and compressed ribbed frs.; sometimes grown in sunny places in the rock-garden. **H. trachypleura.** To 2 ft.: ultimate lf.-segms. thread-like. Mts. Colo., Wyo.

HARDENBERGIA. *Leguminosæ.* Australian vines with pinnate lvs. of 3–5 lfts. or sometimes reduced to 1, small papilionaceous fls. in long racemes, and linear pods.

Grown in the greenhouse or in the open in the South; common in southern California. They require peaty well-drained soil if grown under glass. Propagated by seeds, and by greenwood cuttings in spring under glass.

Comptoniana (*Kennedia Comptoniana*). Lfts. 3 or 5, ovate to narrow-lanceolate: fls. blue or violet: pods to 2 in. long. Var. **alba** has white fls.

monophylla (*Kennedia monophylla. K. ovata*). Lft. 1, ovate to lanceolate: fls. violet or rose. Var. **alba** has white fls. and var. **rosea** pink.

HARDHACK: *Spiræa tomentosa.*

HARDHEADS: *Centaurea nigra.*

HAREBELL: *Campanula rotundifolia* and others.

HARICOT: *Phaseolus vulgaris.*

HARIOTA: *Hatiora.*

HARPALIUM: *Helianthus scaberrimus.*

HARPEPHYLLUM. *Anacardiaceæ.* Diœcious trees with pinnate leathery lvs., fls. in compact axillary panicles, 10 stamens, 4-celled fr. with 2 of the cells small and sterile; 2 species in S. Afr., now and then planted in warm climates.

caffrum. KAFIR-PLUM. Attractive tree to 30 ft. with glossy lvs.: lfts. lanceolate, to 2½ in. long: fls. white or greenish: fr. dark red, size and shape of large olive, edible.—Grown in S. Calif. and S. Fla. for ornament.

HARRISIA. *Cactaceæ.* Arching or vine-like night-blooming cacti with angled or fluted branches, areoles bearing slender needle-like spines: fls. large and showy, funnelform, white or pinkish, borne singly at areoles near end of branches, the tube scaly. Near a score of species, Fla. to Argentina. See *Cacti.*

Bonplandii (*Cereus Bonplandii*). Erect at first, becoming arching or clambering, to 10 ft. and more, sts. to 3 in. diam. and strongly 4-angled, spines 6–8: fls. white, closing soon after sunrise, to 8 or 9 in. long. Brazil, Paraguay, Argentina.

eriophora (*Cereus eriophorus*). To about 1 ft. high, main st. 1½ in. or more diam., ribs 8 or 9, spines 6–9, with dark tips: fls. white inside and pale pink outside, to 7 in. long. Cuba.

gracilis (*Cereus gracilis. C. repandus*). Much branched, to 20 ft., ribs 9–11, spines 10–16 and black-tipped: fls. white, corolla 8 in. long, tube nearly 1 in. with hairs in the axils of its scales. Jamaica.

Martinii (*Cereus Martinii*). Much branched and clambering, 6 ft. or more, radials short, central solitary and about 1 in. long, old sts. terete and spineless: fls. about 8 in. long, white or tinged pink. Argentina.

tortuosa (*Cereus tortuosus*). Erect but soon arching, branches to 1½ in. diam., ribs commonly 7, spines 6–10 and awl-like: fls. white to pink, dull outside, to 6 in. long. Argentina.

HARTMANNIA: *Œnothera.*

HARTOGIA: *Agathosma.*

HARTWEGIA. *Orchidaceæ.* Trop. American epiphytes with pseudobulbs or fleshy sts. bearing 1 lf. and fls. in racemes, the lip saccate at base; grown in the warm greenhouse. See *Orchids.*

purpurea. To 1 ft.: lvs. to 2½ in. long, greenish-brown spotted with red: fls. purple-red, in 3–10-fld. racemes longer than lvs., June–Aug. Mex., Guatemala.

HASTATE: of the shape of an arrow-head but the basal lobes pointed or narrow and standing nearly or quite at right angles; halberd-shaped.

HATIORA (*Hariota*). *Cactaceæ.* A few spineless cacti of the Rhipsalis group, the fls. without tube and rotate and petals erect, the fls. and terete slender branches always terminal; fls. open only in sunlight, blooming in winter and early spring under glass in U. S. Employed and cult. the same as Rhipsalis. See *Cacti.*

salicornioides (*Rhipsalis salicornioides*). Epiphyte: sts. to 6 ft. or more, cylindric, much branched and diffuse, the branchlets 1 in. long more or less and club-shaped with pedicel-like base: fls. about ⅓ in. long, salmon-colored. S. E. Brazil.

HAW, BLACK-: *Viburnum prunifolium* and *rufidulum*. -Medlar: *Cratægomespilus*. Possum-: *Ilex decidua*.

HAWKS-BEARD: *Crepis*.

HAWKWEED: *Hieracium*. Golden Yellow: see *Tolpis barbata*.

HAWORTHIA. *Liliaceæ*. S. African succulent plants without sts., the thick lvs. in dense rosettes which are sometimes elongated, and small white or greenish fls. in simple or panicled racemes on scapes. For cult. see *Succulents;* fancier's plants.

attenuata. Lvs. to 3 in. long and ¾ in. across, 30–40 in a rosette, with white tubercles on back: fls. rosy, the infl. to 2 ft. high.

coarctata. St. elongated to 8 in.: lvs. to 2½ in. long and ¾ in. across, white-warty: fls. lined with red, in simple infl. to 1 ft. high.

cymbiformis. Lvs. to 1½ in. long and ¾ in. across, very thick, entire, pale and glaucescent: fls. very pale pink striped with green, in a simple infl. to 1 ft. high.

margaritifera. Variable species with lvs. to 3 in. long and 1 in. or more broad, 30–40 in a rosette, white-tubercled on both surfaces: fls. in rather dense racemes that may be 6 in. long.

turgida. Lvs. to 1 in. long and ⅓ in. broad, 20–30 in dense rosettes, rounded and somewhat keeled underneath, lined with paler green toward top on upper side: fls. on very short pedicels in a few-fld. raceme.

HAWTHORN: *Cratægus*. India-: *Raphiolepis indica*. Water-: *Aponogeton distachyus*. Yeddo-: *Raphiolepis umbellata*.

HAZEL, CHILE: *Gevuina Avellana*. Winter: *Corylopsis*. Witch-: *Hamamelis*.

HAZELNUT: *Corylus;* see *Filbert*.

HEAD: a short dense spike about as broad as long; capitulum.

HEAL-ALL: *Prunella vulgaris*.

HEARTSEASE: *Viola tricolor* var. *hortensis*.

HEART-SEED: *Cardiospermum*.

HEART-SHAPED: cordate; ovate in general outline but with 2 rounded basal lobes; has reference particularly to the shape of the base of a leaf or other expanded part.

HEATH: *Erica*. Irish-: *Daboëcia cantabrica*. Spike-: *Bruckenthalia spiculifolia*.

HEATHER: *Calluna*. Mock-: *Ericameria ericoides*.

HEBE. *Scrophulariaceæ*. Shrubs or small trees of the southern hemisphere, mainly native in New Zeal., formerly united with Veronica but differing in the mostly evergreen and woody character, leathery always opposite lvs., fls. white to pink, in axillary racemes or spikes or small heads, and in technical characters of the caps. They should no longer be called Veronicas. With the exception of *H. formosa*, the names here listed are of New Zeal. species or derivatives from them.

Several New Zealand names have recently been listed in California but it is not known whether they have come into general cultivation. Those now named in Hebe are *H. Carsei*, *divergens*, *evenosa*, *Haastii*, *Hectori*, *Matthewsii*, *Menziesii*, *pubescens*, *rigidula*, *subalpina*. Others are *Veronica acutiflora*, *monticola*, *Muelleri*. Some of the names of hebes may represent horticultural forms.

Hebes are extensively grown out-of-doors in mild climates, as in California, and sometimes under glass in the North. Several kinds are used as evergreen hedges. Propagated by seeds and by cuttings, those taken from mature plants in autumn blooming the following summer.

albicans (*Veronica albicans*). To 4 ft., much branched: lvs. imbricated, to 1 in. long and ½ in. across, glaucous, entire: fls. white, in many-fld. racemes. By some considered a hybrid; much like *H. amplexicaulis*.

amabilis (*Veronica amabilis*). To 15 ft. or more: lvs. to 4 in. long and 1 in. across, entire: fls. white, ⅓ in. across, in racemes to 6 in. long. Considered to be a hybrid race issuing from *H. elliptica* and *H. salicifolia*.

amplexicaulis (*Veronica amplexicaulis*). To 3 ft., sometimes decumbent: lvs. imbricated, to 1 in. long and ⅔ in. across, glaucous, entire, very thick: fls. white, ¼ in. across, in spikes to 1½ in. long.

Andersonii (*Veronica Andersonii*). Regarded as a garden hybrid between *H. salicifolia* and *H. speciosa:* fls. white tipped with violet. Var. **variegata** has lvs. variegated with creamy-white.

angustifolia (*Veronica angustifolia*). To 8 ft., much branched: lvs. to 3½ in. long and ¼ in. across, keeled beneath, entire: fls. pale lilac, ⅙ in. across, in racemes to 5 in. long.

anomala (*Veronica anomala*). To .5 ft., much branched: lvs. to ¾ in. long and ⅕ in. across, keeled and shining: fls. white or pale pink, ⅓ in. across, in spikes forming short panicles.—Very like *H. buxifolia*.

Balfouriana (*Veronica Balfouriana*). To 3 ft.: lvs. ovate, to ¾ in. long, entire, shining above: fls. pale blue, ½ in. across, in racemes to 3 in. long.

Barkeri (*Veronica Barkeri*). Shrub: lvs. to 2 in. long and ⅔ in. across: fls. pale lilac, ¼ in. across, in racemes to 2 in. long. Cultigen.

Bollonsii (*Veronica Bollonsii*). To 5 ft., much branched: lvs. to 3 in. long and ¾ in. across, edges thickened: fls. pale lilac, ⅓ in. across, in racemes to 4 in. long.

Buchanani (*Veronica Buchanani*). To 1 ft., much branched: lvs. imbricated, about ¼ in. long and broad: fls. white, ⅕ in. across, in short spikes.

buxifolia (*Veronica buxifolia*). To 5 ft.: lvs. imbricated, to ⅓ in. long and ¼ in. across, stiff and thick, entire: fls. white, ⅓ in. across, in spikes to 1 in. long.

carnea (*Veronica carnea*). Apparently a garden hybrid with *H. speciosa* as one parent: fls. rose.

carnosula (*Veronica carnosula*). To 3 ft., often decumbent: lvs. imbricated, to ¾ in. long and ⅔ in. across, glaucous: fls. white, ¼ in. across, in dense spikes.

chathamica (*Veronica chathamica*). To 1½ ft., with prostrate or trailing sts.: lvs. oval, to 1 in. long: fls. purple, ¼ in. across, in racemes to 1 in. long. Var. **erecta** is listed.

Colensoi (*Veronica Colensoi*). To 1½ ft.: lvs. to 1½ in. long and ½ in. across, nearly entire, glaucous beneath: fls. white, ¼ in. across, in racemes about 1½ in. long.

cupressoides (*Veronica cupressoides*). To 6 ft.: lvs. scale-like, 1/15 in. long or to ¼ in. on young plants: fls. pale purple or rarely white, ⅙ in. across, in small terminal heads.

Darwiniana (*Veronica Darwiniana*). Small shrub: lvs. to ¾ in. long and ⅓ in. across, entire, glaucous: fls. white, ¼ in. across, in dense racemes to 1½ in. long.

decumbens (*Veronica decumbens*). To 3 ft., decumbent and much branched: lvs. to ¾ in. long and ⅓ in. across, margins bright red: fls. white, ¼ in. across, in racemes to 1 in. long.

Dieffenbachii (*Veronica Dieffenbachii*). To 4 ft., much branched: lvs. to 4 in. long and 1 in. across: fls. lilac, ¼ in. across.

diosmæfolia (*Veronica diosmæfolia*). To 5 ft. or more, much branched: lvs. to 1 in. long and ⅙ in. across: fls. white or pale blue, ¼ in. across, in corymbose racemes 1 in. long.

Dorrien-Smithii (*Veronica Dorrien-Smithii*). Small straggling shrub: lvs. to 3 in. long and 1¼ in. across, ciliate at margins: fls. white or lavender, ⅕ in. across, in racemes as long as lvs.

elliptica (*Veronica elliptica*. *V. decussata*). To 20 ft., much branched: lvs. to 1¼ in. long and ½ in. across: fls. white or veined purple or pale blue, ⅔ in. across, in racemes to 1½ in. long. Variegated forms are listed.

formosa (*Veronica formosa*). To 4 ft., evergreen: lvs. oval to lanceolate, to 1 in. long, nearly entire: fls. pale lilac, in short racemes. Tasmania.

Gibbsii (*Veronica Gibbsii*). To 1½ ft.: lvs. imbricated, to ¾ in. long and ½ in. across, glaucous, white-ciliate: fls. white, ⅕ in. across, in dense-fld. spikes.

gigantea (*Veronica gigantea*). Tree to 50 ft.: lvs. to 5 in. long and ½ in. across, coarsely toothed when young: fls. white, ⅕ in. across, in racemes to 5 in. long.

gracillima (*Veronica gracillima*). Much branched shrub: lvs. to 2½ in. long and ⅓ in. across: fls. ¼ in. across, in racemes to 5 in. long. Probably a hybrid between *H. angustifolia* and *H. salicifolia.*

Hulkeana (*Veronica Hulkeana*). To 3 ft.: lvs. ovate, to 2 in. long, toothed: fls. pale lilac, to ¼ in. across, in panicles to 1 ft. long.

lævis (*Veronica lævis*). To 5 ft.: lvs. to ⅔ in. long and ⅓ in. across, stiff, entire: fls. white, ¼ in. across, in racemes to 1½ in. long.

leiophylla (*Veronica leiophylla*). To 12 ft.: lvs. to 1¼ in. long and ⅓ in. across: fls. white, ⅕ in. across, in racemes to 4 in. long. Var. **strictissima** differs in more acute lvs. and more upright racemes.

Lewisii (*Veronica Lewisii*). To 6 ft., the branches gray-pubescent: lvs. to 2½ in. long and 1 in. across, margins with white line: fls. pale blue, ⅓ in. across, in racemes to 2½ in. long.

macrantha (*Veronica macrantha*). To 2 ft.: lvs. to 1 in. long, toothed: fls. white, ¾ in. across, in 3–8-fld. racemes.

macrocarpa (*Veronica macrocarpa*). To 8 ft.: lvs. to 6 in. long and 1 in. across: fls. white, to ⅓ in. across, in racemes to 7 in. long. Var. **latisepala** (*Veronica latisepala*) has shorter racemes and fls. deep violet.

macroura (*Veronica macroura*). To 5 ft.: lvs. to 3 in. long and 1¼ in. broad: fls. white or bluish, ⅙ in. across, in dense racemes to 4 in. long.

obtusata (*Veronica obtusata*). To 3 ft.: lvs. to 2 in. long and 1 in. across, with white-hairy margins: fls. bluish-white, ⅕ in. across, in racemes to 2½ in. long.

parviflora (*Veronica parviflora*). Shrub or tree to 20 ft.: lvs. to 2½ in. long and ¼ in. across, entire: fls. white, ⅙ in. across, in racemes to 3 in. long.

pimeleoides (*Veronica pimeleoides*). To 1½ ft., often prostrate, much branched: lvs. to ⅓ in. long, glaucous: fls. dark purple-blue, ¼ in. across, in spikes to 1 in. long.

pinguifolia (*Veronica pinguifolia*). To 4 ft., often decumbent: lvs. imbricated, to ¾ in. long and ½ in. across, glaucous: fls. white, ⅓ in. across, in dense spikes longer than lvs.

rakaiensis (*Veronica rakaiensis*). To 6 ft.: lvs. linear-lanceolate, to 1 in. long, entire, shining above: fls. white, ¼ in. across, in racemes to 2 in. long.—Close to *H. Traversii.*

rotundata (*Veronica rotundata*). To 6 ft.: lvs. to 4 in. long and 1¼ in. across: fls. purple or lilac, ¼ in. across, in racemes to 6 in. long.—Much like *H. macrocarpa*, but caps. almost orbicular and rounded at top.

rupicola (*Veronica rupicola*). To 4 ft.: lvs. to 1 in. long and ⅓ in. across, entire: fls. ¼ in. across, in racemes to 2 in. long.

salicifolia (*Veronica salicifolia*). To 12 ft., much branched: lvs. to 6 in. long and ¾ in. across: fls. white tinged lilac, ⅙ in. across, in racemes 6 in. or more long. Var. **communis** does not differ from the type. In var. **longiracemosa** the racemes are 1 ft. or more long.

speciosa (*Veronica speciosa. V. imperialis* is a garden name). To 5 ft.: lvs. to 4 in. long and 1¾ in. across, entire, shining: fls. dark reddish- or violet-purple, ⅓ in. across, in racemes about 4 in. long.

Townsoni (*Veronica Townsoni*). To 6 ft.: lvs. to 3 in. long and ⅓ in. across: fls. white, ¼ in. across, in racemes to 6 in. long.

Traversii (*Veronica Traversii*). Small shrub: lvs. to 1 in. long and ⅛ in. across, entire: fls. white, ¼ in. across, in racemes to 3 in. long. Var. **elegans** is a slender form with narrower lvs.

vernicosa (*Veronica vernicosa*). To 3 ft., often decumbent: lvs. to ⅔ in. long and ⅓ in. across, entire: fls. white, ⅓ in. across, in racemes to 1½ in. long.

HEBENSTRETIA. *Scrophulariaceæ.* Many kinds of herbs or shrubs with narrow lvs. and yellow or white fls. in dense terminal spikes, the corolla split and 4-lobed, calyx spathe-like; mostly from S. Afr.

Seed should be sown outside in April or inside if earlier results are desired; treated as annuals.

comosa. Per. to 4 ft., with woody sts.: lvs. lanceolate, to 2 in. long, toothed: fls. yellow or white with orange-red blotch on limb, ½ in. long, in spikes to 6 in. long, fragrant at night.

dentata. Similar to *H. comosa* but to 4 ft. high, with lvs. linear and toothed only above middle.

HEDEOMA. *Labiatæ.* Ann. or per. American herbs with opposite small lvs. and small blue or purple 2-lipped fls. in axillary clusters.

Drummondii. Sts. to 16 in.: lvs. linear to oval, to ¼ in. long: fls. pinkish, to ¼ in. long. Tex.

HEDERA. IVY. *Araliaceæ.* Evergreen shrubs climbing by rootlets, with alternate entire or lobed lvs., small greenish fls. in umbels which are panicled or racemed, and fr. a berry; planted as a wall cover, for borders of shrubberies and for ground-cover in shady places, and sometimes as a house and conservatory subject.

Ivy thrives best in rich moist soil. Propagated by cuttings, layers, and seeds which usually do not germinate until the second year. Slow-growing species or forms are sometimes grafted on common stocks.

algeriensis: *H. canariensis.*

arborea: *H. Helix* var. *arborescens.*

azorica: *H. canariensis.*

canariensis (*H. algeriensis. H. azorica*). Lvs. ovate, to 6 in. across, entire or shallowly 3–7-lobed, heart-shaped at base: fr. black. Canary Isls., N. Afr.; adapted to Calif. Var. **variegata** has lvs. edged with yellowish-white.

colchica. Lvs. broadly ovate, to 10 in. long, entire or slightly lobed, heart-shaped at base: fr. black. Caucasus, Persia; for southern states. Var. **dentata** has lvs. remotely toothed.

Helix. ENGLISH I. Lvs. usually 3–5-lobed and margins entire, to 4 in. long, on fruiting branches ovate and unlobed, often with light colored veins: fr. black. Eu., Asia, N. Afr.; stands in protected places in N. Y. and New England but does not attain great size. Runs into many forms, a few of which are: **arborescens** (*H. arborea*), erect, not climbing; **argenteo-variegata**, lvs. variegated or edged with white; **aureo-variegata** (var. *chrysophylla*), lvs. yellow or variegated with yellow; **baltica**, small-lvd. hardy form; **Caenwoodiana**, with small blackish-green lvs. and white veins; **canescens**; **chrysocarpa**, fr. yellow; **conglomerata**, with small crowded lvs.; **digitata**, lvs. digitately 5-lobed; **gracilis**, lvs. rather small, turning bronzy; **hibernica**, lvs. to 6 in. across, with short lobes; **maculata**, lvs. spotted and striped with yellowish-white; **marmorata**, lvs. blotched with yellowish-white; **palmata**, with dull green digitately lobed lvs.; **pedata**, lvs. pedately 5-lobed, with long middle lobe; **tortuosa**, lvs. nearly entire, curled and twisted.

himalaica. Lvs. 2–5-lobed or oblong and unlobed on flowering branches: fr. yellow. Himalayas; stands only far S.

HEDGE. A hedge is a dense permanent row or line of living plants, ordinarily trimmed into more or less formal shape, answering the purpose of a fence, a screen or a windbreak. It is comprised of durable woody plants that make a thick intertangled or impenetrable growth and that withstand shearing. Hedges proper are to be distinguished from edgings, which are low and sometimes temporary lines about walks, flower-beds and borders.

For evergreen hedges the most serviceable plant in general in North America is probably the arbor-vitæ. For choice hedges about the grounds, particularly outside the northern states, some of the retinosporas are useful; also yews. One of the most satisfactory of coniferous plants for hedges is the common hemlock, which stands shearing well and makes a very soft and pleasing mass. Other plants that hold their leaves and are good for hedges are the common box and the privets. The dwarf variety of box can be kept down to a height of 6 inches to a foot for any number of years and is useful for edgings. The larger-growing varieties make excellent hedges 3, 4 and 5 feet high. The ordinary privet or prim holds its leaves well into the winter in the North. The so-called Californian privet holds its leaves rather longer and stands better along the sea-shore, but it is less hardy than the other. In the southern states, nothing is better than *Citrus* (or *Poncirus*) *trifoliata*. Some of the barberries are excellent hedge plants, particularly *Berberis Thunbergii* with its good autumn color (*B. vulgaris* is a host of wheat rust). Native plants of the region often make acceptable hedges.

For hedges of deciduous plants, the most common species are the buckthorn, the European thornapple or cratægus, osage-orange, and various kinds of roses, particularly *Rosa rugosa*. Near the sea in California, *Lavatera assurgentiflora* is employed as a wind-break.

To obtain a good hedge, it is necessary to have a thoroughly well-prepared deep soil, to set the plants close, and to shear them at least twice every year. Arbor-vitæ may be set 1–2½ or 3 feet apart, and hemlock spruce much the same; and these distances may be taken as a general guide for many other plants.

The hedge should be trimmed the year after it is set, although it should not be cut very closely until the plants reach the desired or permanent height. Thereafter it should be sheared into the desired form in spring or autumn. If the plants are allowed to grow a year or two without trimming, they lose the lower leaves and become open and straggly. Osage-orange and some other plants are plashed—that is, the plants are set at an angle rather than perpendicularly, and they are wired together in such a way that they make an impenetrable barrier just above the surface of the ground.

Hedges are much less employed in North America than in Europe, and for several reasons. The climate is relatively dry, and most hedges do not thrive so well here as there; labor is high-priced, and the trimming is likely to be neglected; farms are so large that much fencing is required; timber and wire are cheaper than live hedges. However, they are grown with good effect about home grounds.

HEDGE-THORN: *Carissa Arduina.*

HEDRAIANTHUS: *Edraianthus.*

HEDYCARYA. *Monimiaceæ.* Trees or shrubs sometimes planted in Calif.: lvs. opposite: fls. diœcious, in axillary cymes or racemes: fr. composed of several drupes borne on the receptacle: native in New Zeal., Australia and Pacific Isls.

arborea. To 40 ft.: lvs. oblong or obovate, to 5 in. long, coarsely toothed, leathery: fls. to ½ in. across: drupes bright red, ½ in. long. New Zeal.

HEDYCHIUM. GINGER-LILY. *Zingiberaceæ.* Robust trop. invading per. herbs with strong rootstocks and leafy sts., the fls. borne in bracts on terminal spikes or panicles and having 1 broad petal-like staminode or lip and prominent but smaller lateral ones.

Grown in the greenhouse or frostless countries out-of-doors; prized for the showy flowers and fragrance. They require rich soil and plenty of water or may even be immersed up to the crown. Propagated by division of the roots. See *Zingiberaceæ.*

aurantiacum. To 10 ft.: lvs. to 1½ ft. long and 1 in. wide: fls. orange, the corolla-tube ¾ in. and segms. 1 in. long, filament bright red, in spikes to 6 in. long. India.

chrysoleucum (*H. coronarium* var. *chrysoleucum*). Differs from *H. flavescens* in the base of lip and lateral staminodes deep orange-yellow. India.

coccineum. To 6 ft.: lvs. to 20 in. long and 2 in. wide: fls. red, the corolla-tube 1 in. and segms. 1 in. long, filament pink, in dense spikes to 10 in. long. India. Var. **angustifolium** has shorter lvs. and brick- or salmon-red fls.

coronarium. GARLAND-FLOWER. To 6 ft.: lvs. to 2 ft. long and 5 in. wide: floral bracts large and firm and closely imbricated, with 4–6 white very fragrant fls. under each one; perianth-tube 2–3 in. long; lip large and broad, nearly 2 in. long and 1½ in. broad, 2-lobed and sometimes with smaller lobes, sometimes tinged yellow on lower part; filament with anther shorter than lip: spike somewhat ovate, to 1 ft. long. Trop. Asia; nat. extensively in trop. Amer.

elatum. To 12 ft. or more: lvs. to 2 ft. long and 2½ in. wide: fls. yellowish-white, the corolla-tube 1 in. and segms. ¾ in. long, filament pink, in loose spikes to 1 ft. long. India.

ellipticum. To 5 ft.: lvs. to 14 in. long and 5 in. wide: fls. yellowish-white, the corolla-tube to 3 in. and lobes 1 in. long, filament purple, in dense spikes 4 in. long. India.

flavescens (*H. coronarium* var. *flavescens*). Fls. to 5½ in. long, yellowish, with color deeper in basal part; lip obovate-orbicular, 2-lobed, narrowed to claw; filament with anther slightly exceeding lip, yellow. India, Mascarene Isls.

flavum. To 5 ft.: lvs. to 14 in. long, slender-pointed: spike oblong, the imbricate bracts oblong-ovate and nearly obtuse, 2½ in. long and 2 in. broad; lip obcordate, suddenly narrowed into a short claw, yellow with orange patch in center and below; filament and anther about as long as lip. India.—Other plants have been known as *H. flavum.*

Gardnerianum. Lvs. to 1½ ft. long and 6 in. wide: fls. light yellow, the corolla-tube 2 in. and segms. 1½ in. long, with long-exserted red filament, in spikes to 1½ ft. long. India.

glaucum (*H. gracile* var. *glaucum*). To 5 ft.: lvs. to 10 in. long and 3 in. wide, glaucous beneath: fls. white, the corolla-tube 1 in. and segms. 1¼ in. long, filament red, in loose spikes to 8 in. long. India.

gracile. To 2 ft.: lvs. to 5 in. long and 1½ in. wide, glaucous beneath: fls. greenish-white, the corolla-tube 1 in. and segms. ¾ in. long, filament red, in spikes to 4 in. long. India.

Greenei. To 6 ft.: lvs. to 10 in. long and 2 in. wide: fls. with corolla-tube 1½ in. long and dark red lip 1½ in. long, the linear lobes lighter red, filament red, in dense spikes to 5 in. long. India.

maximum (*H. coronarium* var. *maximum*). Differs from *H. coronarium* in the broader lvs., ciliate bracts, large fls. with lateral staminodes frequently bearing a lobe or tongue from the center, filament tinged pink; lip nearly 2¾ in. long and 1¾ in. broad. India.

spicatum. To 3 ft.: lvs. to 16 in. long and 4 in. wide: fls. yellow, the corolla-tube 3 in. and segms. 1 in. long, filament reddish, in loose spikes to 8 in. long. India. Var. **acuminatum** has lvs. tomentose beneath and purple corolla-lobes.

thyrsiforme. To 6 ft.: lvs. to 14 in. long and 5 in. wide: fls. white, the corolla-tube 1 in. and lobes 1 in. long, filament white, in dense spikes to 4½ in. long. India.

villosum. To 8 ft.: lvs. to 14 in. long and 4 in. wide: fls. with white corolla-tube to 2½ in. long and yellow segms. 1¼ in. long, filament purple, in loose spikes to 10 in. long. India.

HEDYSARUM. *Leguminosæ.* Per. herbs or subshrubs native in the north temp. zone, with pinnate lvs., showy papilionaceous fls. in axillary racemes, and flat pods which separate into joints.

Of easy cultivation in sunny well-drained soil. Propagated by seeds and division. Sometimes planted in borders for ornament.

coronarium. French-Honeysuckle. Per. or bien. to 4 ft.: lfts. elliptic, 3–7 pairs: fls. deep red, fragrant, in summer. Eu. Var. **album** has white fls.

multijugum. To 5 ft.: lfts, obovate, to ½ in. long, 10–20 pairs: fls. violet or purple, in summer. Mongolia.

obscurum. To 1 ft.: lfts. oblong, 5–9 pairs: fls. purple, in summer. Eu.

pabulare. To 2½ ft.: lfts. oblong, 4–7 pairs, to ¾ in. long: fls. purple, ½ in. long, in early summer. Mont. to New Mex.

utahense. To 2 ft.: lfts. oval or oblong, 5–8 pairs, to 1 in. long: fls. rose-purple, to ¾ in. long. Utah, Ida.

HEDYSCEPE. *Palmaceæ.* One unarmed attractive monœcious feather-palm of Lord Howe Isl. in the S. Pacific. From Howea the genus differs in having flexuosely branched spadices, the fls. hardly in pits; ovule attached on wall: fr. larger, about 2 in. long with oblique-lateral stigmatic point, and other technical differences. **H. Canterburyana** (*Kentia Canterburyana*). Tall stout palm with a dense crown of arched recurving lvs.: pinnæ numerous, green both sides, narrow-lanceolate and acuminate, drooping at ends. Grown in Fla. and S. Calif.

HEERIA: *Schizocentron elegans, Heterocentron roseum.*

HEIMIA. *Lythraceæ.* Two trop. American glabrous shrubs with small opposite or whorled lvs., yellow solitary fls. having horn-like appendages at base of calyx-lobes, and capsular frs.; sometimes planted in S. Calif.

myrtifolia. To 3 ft.: lvs. linear or lanceolate, to 2 in. long: fls. ⅙ in. long. Brazil.

salicifolia. To 10 ft.: lvs. linear-lanceolate or lanceolate, to 3½ in. long: fls. to ¾ in. long. Mex. to Argentina.

HELENIUM. Sneezeweed. *Compositæ.* Coarse erect herbaceous annuals and perennials with alternate, toothed or entire lvs. and yellow or brownish heads, mostly radiate, either solitary or in flat-topped clusters in summer and fall; pappus of scales; native in N. and S. Amer.

Heleniums thrive well in fairly rich soil and a sunny situation; they may be propagated by seeds, cuttings and division. They are useful for rear borders and wild-gardens.

aromaticum (*Grahamia aromatica*). Glaucous, much branched: lvs. linear-lanceolate, upper entire, lower pinnately cut: heads of yellow disk-fls. Chile.

autumnale (*H. grandiflorum*). Per. to 6 ft.: lvs. lanceolate or ovate-lanceolate, to 5 in. long, mostly toothed, decurrent on st.: heads to 2 in. across, numerous, rays lemon-yellow to bright yellow, disk yellow, Que. to Fla. and Ariz. Var. **grandiflorum** has large fls. Var. **nanum præcox** is dwarf and early blooming. Var. **pumilum** grows to 2 ft. high. Var. **rubrum,** fls. deep red. Var. **striatum** has rays striped with crimson. Var. **superbum,** fls. large.

Bigelovii. Per. to 4 ft.: lvs. lanceolate, to 10 in. long, decurrent on st.: heads to 2½ in. across, rays yellow, disk brown or brownish-yellow. Calif.

californicum: *H. puberulum.*

grandiflorum: *H. autumnale.*

Hoopesii (*Dugaldia Hoopesii*). Per. to 3 ft.: lvs. oblong-lanceolate, to 10 in. or more long, entire, not decurrent: heads 1 to several, 3 in. across, yellow. Rocky Mts. to Ore. and Calif.

nudiflorum. Per. to 3 ft.: lvs. lanceolate to linear-lanceolate, to 6 in. long, nearly entire, decurrent on st.: heads to 1½ in. across, in clusters, rays drooping, yellow, brown-purple or striped, disk brownish or purplish. N. C. to Fla. and Tex. Var. **grandicephalum striatum,** to 5 ft., heads 2 in. across.

puberulum (*H. californicum*). Per. to 5 ft.: lvs. lanceolate or linear, decurrent: heads solitary, globose, red-brown, ½ in. across, rays reflexed and inconspicuous. Calif.

pumilum: *H. autumnale* var.

tenuifolium. Ann. to 2 ft., very leafy: lvs. thread-like, to 1½ in. long, entire, often whorled: heads to 1 in. across, clustered, yellow. Va. to Fla. and Tex.; northward as a weed.

HELIAMPHORA. *Sarraceniaceæ.* One insectivorous per. native in British Guiana, rarely seen in greenhouse collections. The plant requires much moisture and does best in pots plunged in moss under a bell-glass. Propagated by single crowns. **H. nutans.** To 2 ft.: lvs. or pitchers basal, tubular, winged in front, with very small lid, veined with red: fls. white or pale rose, nodding, several together.

HELIANTHELLA. *Compositæ.* Per. herbs with alternate or opposite lvs. or sometimes the scape leafless, and long-stalked solitary heads of yellow ray-fls. and yellow or brownish disk-fls.; pappus of scales; native in W. N. Amer. Propagated by seeds or division.

Parryi. To 1 ft.: lvs. oblanceolate, to 4 in. long: disk to ¾ in. across, rays ½ in. long. Colo. to Ariz.

quinquenervis. To 2 ft.: lvs. ovate-lanceolate, to 9 in. long: disk to 2 in. across, rays 1 in. long. S. D. to New Mex.

uniflora. To 2 ft.: lvs. oblong-lanceolate, to 5 in. long: disk purple, rays 1 in. long. Mont. to New Mex.

HELIANTHEMUM. Sun-Rose. *Cistaceæ.* Herbs or diffuse low subshrubs adapted to border planting and rock-gardens or for ground-cover, in N. Amer. and Medit. and adjacent regions, having small simple lvs. and yellow, white, rose or purple fls. in terminal racemes in summer.

In the North winter protection is advisable. They thrive in a sunny exposure on dry limestone soil. Propagated by division, greenwood cuttings and seeds. One of the sun-roses (*H. nummularium*) is hardy and common in the North.

alpestre. To 6 in.: lvs. ovate-lanceolate, to ¾ in. long: fls. yellow, ½ in. across. Mts. of S. Eu.

alyssoides. Lvs. ovate-lanceolate: fls. bright yellow, 1½ in. across. S. W. Eu.

appenninum (*H. polifolium. H. pulverulentum*). To 15 in. or sts. procumbent: lvs. oblong, to 1¼ in. long, gray-tomentose: fls. white, 1 in. across. Eu., Asia Minor. Var. **roseum** (*H. rhodanthum*) has reddish fls.

Chamæcistus: *H. nummularium.*

formosum: *H. lasianthum.*

grandiflorum: *H. nummularium* var.

guttatum. To 6 in.: lvs. oblong-lanceolate, to 3 in. long: fls. yellow, often with red spot at base of petals. Medit. region.

halimifolium (*Cistus halimifolius*). To 2 ft.: lvs. oblong to lanceolate, white-tomentose when young: fls. yellow with dark spots on petals, 1¼ in. across. S. Eu., N. Afr.

lasianthum (*H. formosum*). To 3 ft.: lvs. oval to lanceolate, to 1½ in. long: fls. yellow blotched with purple at base, 1½ in. across. Portugal.

mutabile: *H. nummularium* var.

nummularium (*H. Chamæcistus. H. vulgare. H. variabile*). To 1 ft.: lvs. ovate to lanceolate, to 2 in. long, gray-tomentose beneath: fls. yellow, 1 in. across. Medit. region; hardy N. and the common species in cult. Var. **albo-plenum**, fls. double white; **aureum**, fls. deep yellow; **cupreum**, fls. copper-colored often variegated with yellow; **grandiflorum** (*H. grandiflorum*), lvs. ovate, fls. 1¼ in. across; **macranthum**, fls. white blotched with yellow at base; **multiplex**, fls. double; **mutabile** (*H. mutabile*), fls. rose changing to lilac or nearly white; **roseum**, fls. pale rose and **roseum-plenum** with double fls.; **stramineum**, lvs. whitish beneath, fls. with dark yellow spot at base.

ocymoides (*Cistus algarvensis*). To 3 ft.: lvs. oblong-lanceolate, about ½ in. long, gray-pubescent: fls. bright yellow with purple base, 1 in. across. Spain, Portugal.

pilosum. Low subshrub: lvs. linear to oblong, ¾ in. long: fls. white with yellow spot at base of petals, 1 in. across. S. W. Eu., N. Afr.

polifolium: *H. appenninum.*

præcox. Lvs. ovate-lanceolate, to 1½ in. long: fls. yellow, spotted at base. Medit. region.

pulverulentum: *H. appenninum.*

rhodanthum: *H. appenninum* var. *roseum.*

rosmarinifolium. To 2 ft.: lvs. linear, to 1 in. long, white-tomentose below: fls. of two kinds, with and without petals, the former ½ in. across. S. C. to Fla. and Tex.

Tuberaria. Per.: lvs. oval-lanceolate, to 3 in. long, gray-tomentose beneath: fls. yellow, 1½ in. across. S. Eu.

umbellatum. To 2 ft.: lvs. linear or linear-lanceolate, to 1¼ in. long, gray-tomentose beneath: fls. white, 1 in. across. Eu.

variabile: *H. nummularium.*

vulgare: *H. nummularium.*

HELIANTHUS. SUNFLOWER. *Compositæ.* Erect mostly tall coarse ann. and per. herbs with solitary or clustered heads of yellow ray-fls. and yellow, brown or purple disk-fls., blooming in late summer and autumn; pappus of deciduous scales or awns; native in the western hemisphere, mostly N. American. Several species are grown in borders and masses for the showy bloom and one for the edible underground tubers; seeds of the common annual sunflower are sometimes used for poultry-feed, oil and other purposes.

No special culture is required for sunflowers. Any ordinary ground and exposure suits them well. Seeds of annuals are sown where the plants are to stand as soon as the weather is settled, or they may be started under glass two to four weeks in advance if earlier results are desired. Perennials should bloom the year following seed-sowing; they may also be divided, and some species are propagated by root-stolons or offsets.

acutifolius: listed name.

angustifolius. SWAMP S. Per. to 7 ft., sts. rough: lvs. linear, to 7 in. long, entire: heads solitary or few, to 3 in. across, disk purple. Swamps, N. Y. to Fla. and Tex.

annuus (*H. lenticularis*). COMMON GARDEN S. Ann. to 12 ft.: lvs. ovate, to 1 ft. long, toothed, rough on both sides: heads 1 ft. or more across, disk brownish-purple. Minn. to Wash. and Calif. Var. **citrinus**, rays primrose-yellow. Var. **nanus**, dwarf, fls. mostly double. Var. **globosus fistulosus**, heads globular and very large. Var. **variegatus**, lvs. variegated.

argophyllus. SILVERLEAF S. Ann. to 6 ft., gray-silky-pubescent: lvs. ovate to lanceolate, to 6 in. long, slightly toothed: heads 3 in. or more across, disk brownish-purple. Tex.

atrorubens (*H. sparsifolius*). DARKEYE S. Per. to 5 ft., rough-hairy: lvs. ovate or oblong-lanceolate, to 10 in. long, toothed, petioles margined: heads clustered, 2 in. across, disk purple. Va. to Fla. and La.

californicus. Per. to 11 ft.: lvs. oblong to lanceolate, to 9 in. long, pubescent, entire: heads clustered, to 3 in. across, disk yellowish. Calif.

cucumerifolius: *H. debilis.*

debilis (*H. cucumerifolius*). CUCUMBER-LEAF S. Ann. to 4 ft., rough-hairy, branches sometimes mottled purple and white: lvs. ovate or triangular, to 4 in. long, toothed: heads solitary, to 3 in. across, disk brown or purplish. Fla. to Tex. Var. **cupreatus** has coppery-red heads. Var. **purpureus** has pink to purple ray-fls.

decapetalus (*H. multiflorus*). THINLEAF S. Per. to 5 ft.: lvs. ovate to ovate-lanceolate, to 8 in. long, toothed, pubescent beneath: heads numerous, to 3 in. across, disk yellowish. Que. to Ga. and Mo. Double forms are vars. **flore-pleno** and **grandiflorus**. Var. **maximus** has large fls. with pointed rays.

divaricatus. Per. to 7 ft.: lvs. lanceolate or ovate-lanceolate, to 8 in. long, toothed, pubescent beneath, rough above: heads solitary or few, 2 in. across, disk yellow. Me. to Fla. and La.

doronicoides. Per. to 7 ft.: lvs. oblong to ovate, to 8 in. long, toothed, rough on both sides: heads numerous, to 4 in. across, disk yellow. Ohio to Ark.

Dowellianus. Per. to 2 ft.: lvs. ovate or ovate-lanceolate, to 5 in. long, toothed, slightly pubescent: heads to 2½ in. across, disk yellow. D. C. to Ga.—Like *H. occidentalis.*

giganteus. GIANT S. Per. to 12 ft., rough-hairy: lvs. lanceolate, to 6 in. long, toothed: heads several, to 3 in across, disk yellowish. Me. to Fla. and La.

grosse-serratus. Per. to 10 ft., sts. glaucous: lvs. lanceolate, to 8 in. long, toothed, pubescent beneath, rough above: heads several, to 3 in. across, disk yellowish. Me. to Tex.

lætiflorus. SHOWY S. Per. to 8 ft., rough-hairy: lvs. ovate-lanceolate, to 10 in. long, toothed: heads several, to 4 in. across, disk yellow. Pa. to Minn.

lenticularis: *H. annuus.*

macrophyllus: *H. strumosus.*

Maximiliani. Per. to 12 ft.: lvs. lanceolate, to 7 in. long, toothed or entire, rough on both sides: heads to 3 in. across, disk yellowish. Minn. to Tex.

microcephalus (*H. parviflorus*). Per. to 6 ft.: lvs. lanceolate or ovate-lanceolate, to 7 in. long, toothed, rough above, pubescent beneath: heads several, to 1¼ in. across, disk yellow. Pa. to Ga. and La.

mollis. ASHY S. Per. to 5 ft., white-pubescent: lvs. ovate to lanceolate, to 5 in. long, toothed: heads solitary or few, to 3 in. across, disk yellowish. Mass. to Ga. and Tex. Var. **grandiflorus** is listed.

multiflorus: *H. decapetalus.*

orgyalis. Per. to 10 ft.: lvs. linear, to 16 in. long, nearly entire, rough, drooping: heads numerous, 2 in. across, disk brown or purplish. Mo. to Colo. and Tex.

parviflorus: *H. microcephalus.*

perennis: a hort. name.

petiolaris. PRAIRIE S. Ann. to 3 ft., rough-hairy: lvs. ovate to ovate-lanceolate, to 3 in. long, entire or toothed: heads 3 in. across, disk brown. Minn. to Ore. and Calif.

questifolius: a hort. name.

rigidus: *H. scaberrimus.*

rigidus japonicus: trade name.

scaberrimus (*H. rigidus. Harpalium rigidum*). STIFF S. Per. to 8 ft., rough-hairy: lvs. ovate to lanceolate, to 1 ft. long, toothed: heads solitary or few, to 3 in. across, disk purple or brown. Ill. to Ga. and Tex.—In garden forms somewhat double.

scaberrimus (*H. rigidus*). STIFF S. Per. to 8 ft., rough-hairy: lvs. ovate to lanceolate, to 1 ft. long, toothed: heads solitary or few, to 3 in. across, disk purple or brown. Ill. to Ga. and Tex.—In garden forms sometimes somewhat double.

sparsifolius: *H. atrorubens.*

strumosus (*H. macrophyllus*). Per. to 7 ft.: lvs. ovate or ovate-lanceolate, to 8 in. long, toothed, rough above, pubescent beneath: heads several, to 4 in. across, disk yellow. Me. to Ga. and Ark.

tuberosus. GIRASOLE. JERUSALEM ARTICHOKE. Per. to 12 ft., producing edible subterranean potato-like tubers: lvs. ovate to ovate-oblong, to 8 in. long, toothed, rough above, pubescent beneath: heads several, to 3½ in. across, disk yellow. N. S. to Ga. and Ark.—See *Girasole.*

HELICHRYSUM. Everlasting. *Compositæ.* Herbs or shrubs native in the Old World, with usually alternate entire lvs. and solitary or clustered heads of yellow disk-fls., involucral bracts imbricated and often petal-like and bright colored; pappus of bristles.

A few species are grown in the flower-garden and for everlastings to use in the winter bouquet. Propagated by seeds sown out-of doors or started under glass for earlier bloom, and the last species also by cuttings.

angustifolium. Whiteleaf E. Per. to 1 ft., woody at base: lvs. linear, margins revolute, white-tomentose: heads yellow, ⅛ in. across, in corymbs. Medit. region.

bracteatum. Strawflower. Ann. to 3 ft.: lvs. oblong-lanceolate, green: heads solitary, to 2½ in. across, yellow, orange, red or white, as indicated by varietal names **album, bicolor, luteum, purpureum, roseum.** Australia. Var. **monstrosum** (*H. monstrosum*) has double fls. Var. **nanum** is dwarf.

glomeratum. To 1½ ft., woody: lvs. lanceolate, ciliate: heads lemon-yellow, in crowded corymbs. Mts., S. Afr.

lanatum. To 15 in., woody at base: lvs obovate, white-woolly: heads bright yellow, in corymbs to 4 in. across. S. Afr.

monstrosum: *H. bracteatum* var.

petiolatum (*Gnaphalium lanatum*). To 2 ft. or more, woody at base, the sts. flexuose and decorative in hanging-baskets lvs. ovate, white-woolly: heads cream-white, in corymbs to 2 in. across. S. Afr.—Commonly propagated by cuttings and fls. may not be produced.

HELICODICEROS (*Megotigea*). *Araceæ.* One species native in the Medit. region, sometimes grown under glass as a curiosity; the fls. have a very offensive odor. **H. muscivorus** (*Arum crinitum*). Twist-Arum. Tuberous herb to 1½ ft.: lvs. pedately parted: spathe contracted at throat and bent horizontally, the limb pale purple covered with long white hairs, the tube spotted.

HELICONIA (*Bihai*) *Musaceæ.* Stout trop. American herbs with large banana-like lvs., bisexual fls. clustered in the axils of large stiff boat-shaped or conduplicate often woody bracts, and fr. a caps. which breaks up into berry-like parts.

Heliconias are sometimes grown in the greenhouse, or out-of-doors in warm regions for the foliage effects, making large clumps if given room. The plants thrive well in rich loam with plenty of water. Propagated by division of the roots, and by seed when available.

aureo-striata. Sts. striped green and yellow: lvs. with transverse veins striped bright yellow. Native country unknown: probably a form of *H. Bihai.*

Bihai. Wild Plantain. Balisier. To 18 ft.: lvs. to 3 ft. and more long and 1 ft. wide, long-petioled: fls. greenish or greenish-yellow, inclosed in the scarlet ovate-lanceolate deeply boat-shaped bracts to 6 in. long. Trop. Amer.

illustris. Lvs. with midrib and transverse veins marked with pink. S. Sea Isls. Botanical position uncertain. Var. **rubricaulis** has red sts.

psittacorum. To 4 ft. or less: lvs. to 1½ ft. long and 2 in. wide, long-petioled: fls. greenish-yellow, inclosed in shining-red narrow-lanceolate deeply boat-shaped bracts to 3 in. long. Trop. Amer.

Sanderi. Resembling *H. illustris* but lvs. marbled with pink. New Guinea, but botanical identity doubtful.

HELIOCEREUS. *Cactaceæ.* A small group of Mexican and Cent. American bushy cacti differing from Cereus, among other things, in having a scaly or spiny ovary: sts. usually procumbent or clambering but sometimes erect under cult., branches strongly angled or ribbed, spines all alike: fls. diurnal, funnelform, mostly scarlet. They hybridize with other cacti. See *Cacti.*

amecamensis (*Cereus amecamensis*). Ribs 3–5, spines many: fls. white, greenish outside, the tube nearly 1½ in. long, segms. nearly 3 in. long. Mex.

elegantissimus (*Cereus coccineus*). Sts. to 8 in. high and branches often decumbent and to 2 in. broad and commonly 3- or 4-angled, spines needle-like: fls. scarlet, to 6 in. broad, style red, stigma-lobes white. Mex.

speciosus (*Cereus speciosus. C. speciosissimus*). Branching at base, ribs 3–5 and undulate, spines numerous and becoming yellow or brownish: fls. scarlet, 6–7 in. long, stigma-lobes red. Mex., probably Cent. Amer.

HELIOPSIS. *Compositæ.* Herbaceous sunflower-like perennials blooming in summer, with opposite coarsely toothed lvs. and showy heads of long yellow ray-fls. and disk-fls. partly inclosed in chaffy bracts; pappus none or a toothed border; native to N. Amer. Cult. as for *Helianthus.*

helianthoides (*H. lævis*). Per. to 5 ft., nearly glabrous: lvs. ovate, to 6 in. long, sometimes roughish above: heads to 2½ in. across, numerous. Ont. to Fla. and Tenn. Var. **Pitcheriana** (*H. Pitcheriana*), fls. deeper yellow.

lævis: *H. helianthoides.*

Pitcheriana: *H. helianthoides* var.

scabra. Differs from *H. helianthoides* chiefly in being rough-hairy and the heads few or solitary. Me. to N. J. and New Mex. Vars. are **excelsa,** chrome-yellow, nearly double; **gratissima,** pale yellow; **imbricata,** dwarf, fls. 3 in. across, golden-yellow; **major,** larger than type; **zinniæflora,** double-fld.

HELIOTROPE: *Heliotropium.* Garden-: *Valeriana officinalis.* Winter-: *Petasites fragrans.*

HELIOTROPIUM. Heliotrope. *Boraginaceæ.* Herbs or shrubs with mostly alternate simple lvs. and small often very fragrant violet, purple or white fls. in coiled racemes and cymes, corolla naked in the throat; some of them are popular in greenhouses and borders and others are weedy plants.

The greenhouse heliotropes are treated as annuals and require abundant heat and light rich soil. Propagated by cuttings and seeds; the latter may be sown indoors and the seedlings transplanted. Strong plants may be set out and the new growths pegged to the ground where they will form roots.

amplexicaule (*H. anchusæfolium*). Per., yellowish-hairy: lvs. lanceolate to linear-lanceolate, sessile: fls. violet. ¼ in. across. Argentina.

anchusæfolium: *H. amplexicaule.*

arborescens (*H. peruvianum*). Common H. Per. to 4 ft.: lvs. oval or oblong-lanceolate: fls. violet or purple varying to white, ⅛ in. long, vanilla-scented. Peru.—Common under glass and sometimes planted out.

convolvulaceum: *Euploca convolvulacea.*

corymbosum. Perhaps a form of *H. arborescens* but by gardeners thought to be distinguished by its longer narrower lvs. distinctly narrowed at base: fls. violet or purple varying to white, ¼ in. long, narcissus-scented. Peru.

europæum. Ann. to 1 ft., pubescent: lvs. oval, long-stalked: fls. white, ⅛ in. across. Eu.; nat. in E. U. S.

peruvianum: *H. arborescens.*

HELIPTERUM. Everlasting (which see). *Compositæ.* Flower-garden annuals, often cut early and dried for winter bouquets, with mostly alternate entire lvs. and solitary or clustered heads of yellow disk-fls., the involucral bracts often petal-like and colored; pappus plumose; native in S. Afr. and Australia.

Culture is simple. Seeds usually are sown where plants are to grow but may be started indoors for earlier results. Plants may stand 6–12 inches apart.

anthemoides. To 1 ft., with per. rootstock, glabrous: lvs. linear: heads to 1 in. across, solitary, the bracts white tinged brown. Australia.

corymbiflorum. To 1 ft., white-woolly: lvs. linear or lanceolate: heads small, in corymbs, bracts white. Australia.

Humboldtianum (*H. Sandfordii*). To 1½ ft.: lvs. linear, white-tomentose: heads small, in clusters, bracts yellowish-green. Australia.

Manglesii (*Rhodanthe Manglesii*). Swan River E. Slender, to 1½ ft., glabrous: lvs. ovate: heads not clustered, to 1½ in. across, bracts white to bright pink. Australia. Var. **maculata,** bracts spotted red.

roseum (*Acroclinium roseum*). Stout, to 2 ft., glabrous: lvs. linear to lanceolate: heads not clustered, to 2 in. across, bracts rose or white. Australia.

Sandfordii: *H. Humboldtianum.*

HELLEBORE: *Helleborus.* **False:** *Veratrum.*

HELLEBORUS. Hellebore. *Ranunculaceæ.* Per. herbs with thick fibrous roots, mostly basal palmately divided lvs., large fls. with 5 petal-like sepals, inconspicuous petals and many stamens, and fr. a follicle; native in Eu. and Asia.

Hellebores bloom in early spring or in winter in mild climates, although *H. niger* is very hardy and persistent. They thrive in partially shaded moist situations in good soil. Propagated by division of roots, preferably in late summer or fall; also by seeds. Hellebores may also be forced under glass.

atrorubens: *H. orientalis* var.

fœtidus. To 1 ft.: lvs. leathery, borne on st.: fls. green or marked purple, to 1 in. long. W. Eu.

hybridus: mentioned name.

lividus. To 1½ ft.: lvs. 3-parted, toothed, borne near bottom of plant: fls. pale green, in a cluster. Corsica.

niger. Christmas-Rose. To 1½ ft.: lvs. basal, divided into 7 or more oblong evergreen lfts., the st. with few small lvs.: fls. white or purplish with green petals, to 2½ in. across, solitary. Eu.

orientalis. Differs from *H. niger* in having branched fl.-sts. without lvs. and fls. 2–6 together. Asia Minor. Var. **atrorubens** (*H. atrorubens*). Fls. dark purple outside, greenish-purple inside.

purpurascens: form of *H. viridis.*

viridis. To 2 ft.: lvs. divided into 7–11 oblong lfts.: fls. yellowish-green, 1 in. long, drooping, subtended by lvs. Eu.; nat. in E. N. Amer.

HELONIAS. *Liliaceæ.* One per. spring-blooming herb with tuberous roots, native in bogs from N. J. to N. C. **H. bullata.** Swamp-Pink. To 2 ft.: lvs. basal, to 15 in. long and 2 in. wide: fls. pink or purplish, ¼ in. long, in dense racemes to 3 in. long terminating the hollow scape.—Suitable for bog-gardens and also a good pot-plant for late winter and spring. Easily propagated by division.

HELWINGIA. *Cornaceæ.* Asian shrubs, one of which is sometimes grown as a curiosity and ornamental: lvs. alternate, toothed: fls. diœcious, small, borne in clusters on upper surface of lvs.: fr. a berry-like drupe. Propagated by cuttings of green wood under glass.

japonica. To 5 ft.: lvs. ovate, to 3 in. long: fls. greenish-white: fr. black, ¼ in. across. China, Japan; hardy in north-central parts.

HELXINE. *Urticaceæ.* One creeping moss-like little herb from Corsica and Sardinia, used as a ground- and pot-cover in greenhouses and in rock-gardens in mild climates, making dense mats. **H. Soleirolii.** Lvs. nearly orbicular, ¼ in. or less across: fls. unisexual, minute, solitary in the axils.—It thrives in partial shade. Propagated by cuttings of the rooting sts.

HEMEROCALLIS. Day-Lily. *Liliaceæ.* Per. herbs with cord-like or more or less tuberous roots, linear or sword-shaped basal lvs. and showy yellow, fulvous or orange fls. in clusters at the ends of leafless scapes, the perianth-segms. partially united below to form a tube of varying length; stamens and style prominent.

An important group of hardy spring- and summer-blooming herbs with lily-like flowers, of simple cultural requirements in any good garden soil. Propagated by division, and sometimes by seeds if available. Some of the species do not produce seeds in ordinary garden conditions. The foliage, forming mats, is useful as ground-cover. There are many good named horticultural varieties. The day-lilies fall into two groups as determined by the mode of flower-bearing: the forking kinds in which the flowers are borne in a more or less open or branched cluster terminating the scape, the involucrate kinds in which the flowers are close together and practically sessile in a head-like cluster subtended by broad short bracts resembling an involucre. To the latter group belong *H. Dumortierii* and *H. Middendorffii,* all the other species being of the dichotomous or forking group. Certain garden kinds are probably hybrids between the two groups.

aurantiaca. Golden Summer D. To 3 ft.: lvs. to 3 ft. long and 1 in. or more across: fls. clear burnt-orange or salmon-orange, not fragrant, late spring and summer. Japan. Var. major is larger and apparently the common form: fls. erect on stiff scapes, 6 in. across when expanded.

citrina. Long Yellow D. To 4 ft. and more: lvs. to 3 ft. long and 1 in. or more across: fls. light lemon-yellow, to 6 in. long, very fragrant, not open broadly in full daylight, on stiff scapes, summer. China.—*H. serotina* is often called by this name.

disticha *H. fulva.*

Dumortierii (*H. rutilans. H. Sieboldii*). Narrow Dwarf D. To 1 ft. or so: lvs. to 1½ ft. long and ½ in. across: fls. pale orange, to 2¾ in. long, the tube very short, outer segms. lanceolate-acute, fragrant, 2–4 of them together in a close head or cluster, spring. Japan.

flava. Tall Yellow D. To 3 ft.: lvs. to 2 ft. long and ¾ in. across: fls. yellow, to 4 in. long, fragrant, on weak more or less lopping scapes, spring. Siberia to Japan; Eu.—Common early yellow day-lily.

fulva (*H. disticha*). Tawny or Fulvous D. To 6 ft.: lvs. to 2 ft. long and 1⅓ in. across: fls. fulvous or rusty orange-red, to 5 in. long, not fragrant, to 3½ in. across when fully expanded, usually with darker lines and stripes, summer. Eu., Asia; nat. in E. U. S.—The commonest day-lily of midsummer. Var. **Kwanso** has double fls.: plant usually stouter and blooms somewhat later.

Kwanso: *H. fulva* var.

luteola. Hybrid between *H. serotina* and *H. aurantiaca* var. *major:* fls. golden-yellow.

Middendorffii. Broad Dwarf D. To 1 ft. or so: lvs. to 1½ ft. long and 1 in. across: fls. pale orange, in a close cluster or head, to 2¾ in. long, the segms. broad and mostly obtuse and recurving at full bloom and thereby differing from *H. Dumortierii,* spring. Siberia.

minor. Dwarf Yellow D. To 18 in.: lvs. to 20 in. long and ¼ in. across: fls. mostly 2 or 3, yellow, 4 in. long, fragrant, spring. E. Siberia to Japan.—Plants grown under this name are likely to be *H. Middendorffii* or hybrids from it.

rutilans: *H. Dumortierii.*

serotina (*H. Thunbergii*). Late Yellow D. To 3 ft.: lvs. to 2 ft. long and ¾ in. across: scapes stiff and erect, more or less 3-angled; fls. lemon-yellow, 3 in. long, slightly fragrant, summer. Japan. —Sometimes grown erroneously as *H. citrina*; the prevailing yellow summer day-lily.

Sieboldii: *H. Dumortierii.*

Thunbergii: *H. serotina.*

HEMIANDRA. *Labiatæ.* Shrubs from W. Australia, with opposite narrow lvs. and white or pink 2-lipped fls. solitary in the axils; one species intro. in Calif.

pungens. To 2 ft., stiff: lvs. linear or linear-lanceolate, pungent-pointed: fls. with dark spots.

HEMICYCLIA. *Euphorbiaceæ.* Trees and shrubs with alternate entire leathery lvs., small diœcious fls. solitary or clustered, and fr. a 1-seeded drupe; native E. Indies to Australia, one intro. in warm regions.

australasica. Tree to 40 ft.: lvs. ovate, to 3 in. long, obtuse: fr. ovoid, ½ in. long, red and succulent. Australia.

HEMIGRAPHIS. *Acanthaceæ.* Asian herbs or shrubs with opposite lvs. and tubular 5-lobed fls. subtended by large bracts and borne mostly in terminal heads; one species grown in S. Fla. as a basket or cover plant, but must be protected or kept in the greenhouse in winter. Propagated by cuttings.

colorata. Prostrate rooting per.: lvs. ovate-cordate, to 3 in. long, purplish, toothed, bullate: fls. white, ¾ in. long. Java.

HEMIONITIS. *Polypodiaceæ.* Small trop. ferns with palmately or pinnately lobed lvs., fertile stiff and long-stalked, sterile short-stalked; sori naked, borne along the veins. Sometimes grown in fern-cases, making attractive little subjects. Propagated by buds and spores. See *Ferns.*

palmata. Strawberry-Fern. Lvs. palmate, to 6 in. long and wide, with 5 triangular divisions, pubescent. W. Indies, Mex., S. Amer.

HEMIPTELEA. *Ulmaceæ.* One small much branched deciduous spiny tree native in N. E. Asia. **H. Davidii** (*Zelkova Davidii*). Lvs. alternate, elliptic, to 2 in. long, coarsely toothed, very short-stalked: fls. in clusters on young branchlets: fr. a small winged nutlet.—Hardy N. and sometimes planted for hedges. Propagated by seeds, layers, grafting on elm.

HEMLOCK: *Tsuga.* **Ground-**: *Taxus canadensis.* **Poison-**: *Conium maculatum.* **Water-**: *Cicuta.*

HEMP: *Cannabis sativa.* **Bowstring-**: *Sansevieria.* **Indian**: *Apocynum cannabinum.* **Manila**: *Musa textilis.* **Sisal**: *Agave sisalana.* **-Tree**: *Vitex Agnus-castus.*

HEMPWEED, CLIMBING: *Mikania scandens.*

HEN-AND-CHICKENS: *Sempervivum tectorum.*

HENBANE: *Hyoscyamus.*

HENEQUEN: *Agave fourcroydes.*

HENNA: *Lawsonia inermis.*

HEPATICA. Liverleaf. *Ranunculaceæ.* Little per. hardy herbs with long-stalked, basal, 3-lobed, evergreen old lvs. and white or purple fls. solitary on the end of a scape, the sepals petal-like, the apparent calyx being an involucre of 3 small lvs.; native in north temp. zone, blooming in early spring. Hepaticas prosper in rich well-drained soil. They are woods plants, useful for colonizing. Propagated by seeds and division of roots.

acutiloba. To 9 in., differing from *H. americana* chiefly in the lobes of the lvs. and involucre being acute. Me. to Ga., and Mo.

americana (*H. triloba* and *Anemone Hepatica* as to the American plant). To 6 in., with petioles and scapes shaggy-hairy: lvs. with 3 rounded or obtuse lobes: fls. ½ to 1 in. across, lavender-blue but passing into white and rose-colored forms. N. S. to Man. and Fla.

angulosa (*Anemone angulosa*). To 6 in., hairy: lvs. 3–5-lobed, the lobes often toothed: fls. about 1¼ in. across. Hungary.

nobilis (*H. triloba* and *Anemone Hepatica* as to the European plant). Much like *H. americana* but petioles and scapes less hairy and fls. 1 in. or more across, blue, rose, whitish, cult. also in double forms. Continental Eu.

triloba: *H. americana* and *H. nobilis.*

HERACLEUM. Cow-Parsnip. *Umbelliferæ.* Coarse per. herbs with large ternately compound lvs., white or pinkish fls. in compound umbels, and flattened frs.; planted in wild-gardens for bold effects and sometimes as specimen plants. They thrive on rich moist soil. Propagated by seeds and division.

giganteum: *H. villosum.*

japonicum: listed name.

lanatum. To 8 ft.: lfts. broad-ovate, lobed and toothed, tomentose beneath: umbels to 1 ft. across. N. Amer.

Mantegazzianum. To 9 ft.: lvs. to 3 ft. long, deeply cut: fls. white, the umbels to 4 ft. across. Caucasus.

villosum (*H. giganteum*). To 12 ft.: lfts. deeply cut and toothed, woolly-tomentose beneath: fls. white. Caucasus.

HERALDS-TRUMPET: *Beaumontia grandiflora.*

HERB: plant naturally dying to the ground; without persistent living stem above ground; lacking definite woody firm structure. It may be annual, biennial or perennial. **-Christopher**: *Actæa.* **-Paris**: *Paris quadrifolia.* **-Patience**: *Rumex Patientia.* **-Robert**: *Geranium Robertianum.*

HERBARIUM: a permanent collection of pressed dried specimens, together with properly preserved fruits and other parts, representing the kinds of plants, for record and critical study.

HERCULES-CLUB: *Aralia spinosa, Zanthoxylum Clava-Herculis.*

HEREROA. *Aizoaceæ.* Separated on technical characters from Mesembryanthemum (which see for cult.): plant stemless or nearly so: lvs. entire, rather elongated and soft, with large dark dots, opposite in four rows: fls. yellow. **H. dolabriformis** (*M. dolabriforme*) has st. at length to 6 or 8 in., per.: lvs. hatchet-shaped (dolabriform), glaucous, to 1½ in. long and nearly or quite half as broad at apex: fls. in 3's or 5's, the petals ½ in. long. S. Afr.

HERMESIAS: *Brownea.*

HERNIARIA. Herniary. Rupture-Wort. Burst-Wort. *Caryophyllaceæ.* Ann. or per. trailing mat-forming little herbs, with roots of short duration: lvs. small and sessile: fls. small, green and crowded in axillary clusters; native in sandy places, usually near the sea, in Eu., W. Asia, N. Afr. and the Canaries and 1 in S. Afr. Grown for carpet-bedding, rock-gardens and for covering graves.

cinerea. Light gray hairy ann., sts. ascending: lvs. oblong-linear: fls. sessile, in 7–10-fld. clusters. Medit. region, Canary Isls.

glabra. Per. 4–6 in., sts. with swollen joints, spreading along the ground several inches: lvs. oblong, usually bronzy-red in winter: fls. sessile, in axillary 7–8-fld. clusters on the lateral branches, making a leafy spike. Eu., Asia.

hirsuta. Hairy per. to 6 in., sts. prostrate: lvs. elliptic-oblong: fls. sessile, in 7–10-fld. clusters. Eu.

HERNIARY: *Herniaria.*

HERONSBILL: *Erodium.*

HERPETICA: *Cassia alata.*

HESPERALOE. *Liliaceæ.* Stemless herbs similar to Yucca but with greenish or reddish fls. opening by day; native Tex. to Mex.

Engelmannii: *H. parviflora* var.

parviflora (*H. yuccæfolia*). To 4 ft.: lvs. to 4 ft. long and 1 in. wide, the margins thread-bearing: fls. rose, 1¼ in. long, nodding. Tex. Var. Engelmannii (*H. Engelmannii*) has more bell-shaped fls. about 1 in. long.

yuccæfolia: *H. parviflora.*

HESPERETHUSA. *Rutaceæ.* One spiny bush or small tree, **H. crenulata,** NAIBEL, native India to Indo-China, grown somewhat in the citrus country for ornament and curiosity, allied to Feronia: evergreen: lvs. odd-pinnate, with small crenulate lfts. and very broadly winged rachis and petiole: fls. small, white, fragrant: fr. ½ in. or less diam., globose, with very bitter pulp. A good pot plant; grows on Citrus stocks.

HESPERIS. ROCKET. *Cruciferæ.* Bien. and per. erect branching herbs of Eu. and Asia: lvs. narrow, entire or toothed, mostly undivided: fls. white to rose, mauve-purple, often showy, in long terminal mostly paniculate racemes, sometimes fragrant: fr. an elongated pod or silique.

matronalis. DAMES-R. or DAMES-VIOLET. Rather coarse per. or sometimes bien. to 3 ft., hirsute to glabrous, much branched: lvs. lanceolate to lance-ovate, to 4 in. long, toothed: fls. large, ½ in. and more across, fragrant, lilac or light purple, varying to white (var. nivea) and to double forms, late spring, early summer. Eu.; nat. in N. Amer.—Propagated by seed sown a season in advance of blooming.

nivalis. Per., 1 ft., green or minutely pubescent: lvs. lance-oblong, entire, to 2 in. long and ¾ in. broad: fls. pale lead-color, in a lax raceme. Near snow-line, mts. of Persia.—Plants grown under this name may be white forms of *H. matronalis.*

HESPEROSCORDUM HYACINTHINUM: *Brodiæa lactea.*

HESPEROYUCCA. *Liliaceæ.* One S. Californian plant with very short woody caudex and basal rosette of narrow lvs. **H. Whipplei** (*Yucca Whipplei*). Lvs. to 1¾ ft. long and ¾ in. across, rigid, finely toothed and terminating in sharp spine: fls. creamy-white, to 2 in. long, fragrant, nodding, in panicles on scapes to 12 ft. high, the perianth-segms. distinct. Hardy only in warm climates. Cult. as for *Agave.*

HETEROCENTRON. *Melastomaceæ.* Herbs or subshrubs native in Mex. and Cent. Amer., having entire lvs., white, rose or purple fls. in panicles, and capsular fr.; grown out-of-doors in warm regions or under glass for the numerous small pleasing fls. Propagated by cuttings.

elegans: *Schizocentron elegans.*

mexicanum: the plant cult. under this name is *H. roseum.*

roseum (*Heeria rosea*). To 2 ft., the branches 4-angled: lvs. oblong, to 2 in. long: fls. rose or white in var. alba, ½ in. long. Mex.

HETEROMELES. *Rosaceæ.* One evergreen shrub native in Calif. and Lower Calif. and much planted there for ornament and employed in holiday decorations. **H. arbutifolia** (*Photinia arbutifolia*). TOYON. CHRISTMAS-BERRY. To 15 ft.: lvs. oblong, to 4 in. long, sharp-toothed, thick, dark green and shining above: fls. white, ¼ in. across, in panicles to 3 in. high: fr. bright red or yellow, ¼ in. long, persistent through winter.—Not hardy N. Propagated by seeds, cuttings, and by layers.

HETEROSPATHE. *Palmaceæ.* Several species of monœcious unarmed feather-palms, native in Philippines and S. Sea Isls., one of which is sometimes planted in S. Fla. Infl. among the lvs., much branched; fls. in 3's, 2 outer ones staminate or in 2's and both staminate on upper part of branches; stamens 6: fr. globular, size of a pea, stigmatic point near or toward the apex; seed 1. For cult. see *Palm.*

elata. Graceful ringed palm to 30 ft. with deep green arching lvs. on long petiole and many drooping strongly nerved pinnæ 2–3 ft. long and 1½ in. or less broad with thickened margins and narrowed to a long point: fr. about ¼ in. across, slightly rugose, becoming white.

HETEROSPERMUM. *Compositæ.* Ann. herbs from Mex. to S. Amer., with opposite lvs. and small heads of yellow fls. with few rays; pappus none or of awns. Grown in flower-garden.

pinnatum. To 1 ft.: lvs. 1–2-pinnate into linear segms.: heads ¼ in. long. W. Tex., Ariz., Mex.

HEUCHERA. ALUM-ROOT. *Saxifragaceæ.* Herbaceous perennials with a tuft of rounded or broad 5–9-lobed toothed lvs. cordate at base, from which spring many slender scapes, overtopping foliage, with small cup-shaped, urn-shaped or saucer-shaped, greenish, white, red or purplish fls. in narrow panicles or racemes; native in N. Amer., largely in the western part.

One (*H. sanguinea*) is common in the perennial border and a few others are sometimes grown in rockeries and wild-gardens. They thrive in the average garden soil, preferably in an open situation. Propagated by division of the clumps in spring or in autumn, or by seed. These plants are native mostly on cliffs, hills and mountains.

alba: *H. sanguinea* var.

americana. To 3 ft.: fls. greenish-white, petals about length of calyx-lobes, stamens much exserted: foliage mottled when young, becoming plain green. Ont. to La. and Minn.

bracteata. Densely tufted, to 6 in.: petals very narrow, slightly longer than calyx-lobes, the infl. spike-like, stamens slightly exserted. Colo., S. Wyo.

brizoides: see *H. lithophila.*

chlorantha. Tufted, to 3 ft.: fls. greenish, infl. spike-like; the petals very small or wanting, stamens included. B. C. to Ore. and Ida.

convallaria: hort. name for a form with long-stalked panicles of fls. somewhat like lily-of-the-valley; also a pink-fld. form.

cylindrica. To 2 ft.: infl. spike-like, fls. yellowish-green, the petals minute or sometimes lacking. Ore., Ida., Mont.

gracillima: *H. sanguinea* var.

hispida. To 4 ft., sts. white-hairy: fls. in narrow panicles, the petals as long as or slightly shorter than sepals. Mts., Va., N. C.

hybrida: *H. sanguinea* var.

lithophila. To 2½ ft. in cult., the infl. a narrow diffuse long panicle of small pinkish fls. about ⅛ in. long, the narrow petals twice as long as sepals. Mts., Calif.—Has been grown as *H. brizoides*, a reputed hybrid.

micrantha. To 2 ft.: fls. whitish, in loose panicles, petals about length of calyx. Calif. to B. C.

pubescens. To 3 ft.: fls. purplish, in open panicles, petals slightly longer than calyx-lobes. Rich woods in mts., Pa. to N. C.

Rosmondi: hort. form with coral-pink fls., to 1½ ft.

rubescens. To 15 in.: fls. in open panicles, with sepals pinkish, green-tipped, petals about twice as long as sepals. Mts., Utah to Ore. and Calif.

sanguinea. CORAL-BELLS. To 2 ft.: infl. open, fls. bright red (in cult. sometimes whitish, pink or crimson), to ½ in. long, bell-shaped, petals shorter than calyx. New Mex., Ariz. and Mex. but hardy N. There are many hort. vars. as: **alba**, fls. white; **gracillima** and **gracillima rosea**, slender form; **hybrida**, robust; **maxima** and **splendens**, fls. dark crimson; Virginal.

villosa. To 3 ft.: panicles open, fls. nearly white, petals twice as long as calyx. Va. to Ga. and Tenn.

HEVEA. *Euphorbiaceæ.* Brazilian trees with milky juice which is the most important single source of rubber, lvs. of 3 lfts., small monœcious fls. without petals, in panicles, and fr. a large caps.; sometimes grown for ornament.

It does best in hot damp climates. Propagated by seeds, and sometimes by cuttings as an ornamental subject or when grown under glass for interest.

brasiliensis. PARA RUBBER OR CAOUTCHOUC TREE. To 60 ft.: lfts. elliptic, sometimes as much as 2 ft. long: fls. white: seeds about 1 in. long. Amazon.

HEXASTYLIS: *Asarum.*

HIBBERTIA. *Dilleniaceæ.* Mostly Australian shrubs with erect, procumbent or climbing sts.: lvs. small and often heath-like: fls. yellow or white, solitary and terminal. Grown out-of-doors in S. Calif.

cuneiformis: *Candollea cuneiformis.*

dentata. Sts. trailing or twining: lvs. oblong, to 2½ in. long, slightly toothed, petioled: fls. dark yellow, to 2 in. across, with numerous stamens.

perfoliata. Sts. procumbent or ascending: lvs. ovate, to 2 in. long, slightly toothed, perfoliate: fls. pale yellow, with numerous stamens.

volubilis. Sts. trailing or twining to 30 ft.: lvs. obovate to lanceolate, to 3 in. long, clasping at base, silky-pubescent beneath: fls. yellow, with numerous stamens.

HIBISCUS. ROSE-MALLOW. *Malvaceæ.* Herbs, shrubs or small trees with alternate palmately lobed lvs., mostly very large and showy fls. from white to yellow and scarlet, and dry capsular 5-valved fr.; popular ornamental subjects, a few also grown for the edible parts. Species of hibiscus are among the most showy fls. of the tropics; they are specially abundant and prized in Hawaii.

The annual flower-garden sorts may be grown from seed sown where the plants are to stand. The perennials are propagated by seed or division; many of these are native in swamps and should have plenty of moisture. The shrubby kinds may be grown from seed sown in pots and transplanted; also by cuttings and grafting. See also *Okra* and *Roselle.*

Abelmoschus (*Abelmoschus moschatus*). MUSK-MALLOW. Ann. or bien. to 6 ft.: lvs. variously lobed: fls. yellow with crimson center, 4 in. across: fr. to 3 in. long, the seeds with musky odor sometimes used in perfumery. India.

africanus: *H. Trionum.*

Arnottianus. Shrub or small tree: lvs. ovate, entire: fls. white, sometimes with pinkish veins, 4 in. or more across, handsome; calyx-teeth short; bracts of involucel ⅛ in. or less long. Hawaii.

calisureus: hort. name, probably *H. Trionum.*

Calleri: *H. Rosa-sinensis* var.

calycinus (*H. chrysanthus*). Small shrub: lvs. round, angled: fls. lemon-yellow with dark center, to 3 in. across. S. Afr.; grown in Calif. and similar climates.

cannabinus. Ann. or per. with prickly st.: upper lvs. with deep narrow lobes: fls. yellow, with crimson center. Tropics of Old World.—Yields fiber.

chrysanthus: *H. calycinus.*

coccineus (*H. speciosus*). Per. to 10 ft., glaucous: lvs. with deep slender lobes: fls. rose-red or crimson, to 6 in. across. Swamps, Ga. and Fla.

Cooperi: *H. Rosa-sinensis* var.

Denisoni. Lvs. ovate, leathery, entire: fls. white. Much like *H. Arnottianus* but calyx deeply cleft and involucel bracts much longer. Origin doubtful.

diversifolius. To 8 ft., shrubby and prickly: lower lvs. deeply 3–5-lobed, upper toothed: fls. yellow with dark center. Afr., Pacific Isls., Australia.

elatus (*Paritium elatum*). Supposed to differ from *H. tiliaceus* in greater stature, larger fls. that change from yellow to red, involucre and calyces deciduous from ripe fr., and hairy seeds, but some of the plants so called not separable from that species.

esculentus (*Abelmoschus esculentus*). OKRA. GUMBO. Ann. to 6 ft.: lvs. variously lobed or divided: fls. yellow with reddish center, to 3 in. long: fr. to 1 ft. long, ribbed, becoming woody, when immature eaten as a vegetable. Tropics of Old World.—See *Okra.*

gossypinus. Tall shrub: lvs. ovate, finely toothed: fls. yellow, small, with an involucre of thread-like lfts. shorter than calyx-lobes. S. Afr.; adapted to Calif. and similar climates.

grandiflorus. GREAT R. Velvety per. to 6 ft. or more: lvs. commonly broader than long and 3-lobed: fls. pale pink with reddish in bottom, petals to 6 in. long. Marshes, Ga., Fla., Miss.—Allied to *H. Moscheutos*; perhaps sometimes transplanted.

Hamabo. Shrub to 10 ft. or more: lvs. round, slightly toothed, white-tomentose beneath: fls. yellow, darker at base, 3 in. across. Japan; thrives in southernmost regions.

heterophyllus. Tall shrub: lvs. simple or divided into long narrow lobes: fls. white with crimson or purple center, to 4 in. long. Australia; adaptable to southern parts of the country.

Huegelii. Tall shrub, mostly tomentose: lvs. deeply 3–5-lobed: fls. violet-purple, petals to 3 in. long. Australia. Var. **glabrescens** is nearly glabrous.

incanus. Per. to 6 ft.: lvs. ovate-lanceolate, toothed, white-tomentose beneath: fls. white or pink with crimson center, to 4 in. long. Swamps, Md. to Fla. and La.

Manihot (*Abelmoschus Manihot*). Ann. or per. to 9 ft.: lvs. divided into long narrow lobes: fls. yellow or whitish with dark brown center, to 9 in. across. Probably E. Asia.—Showy in bloom; widely spread as a more or less weedy plant.

militaris. SOLDIER R. Per. to 6 ft.: lvs. halberd-shaped: fls. white or pink with purple center, to 5 in. across. Pa. to Fla. and La.

Moscheutos (*H. palustris*). COMMON R. Per. to 8 ft.: lvs. ovate, longer than broad, not lobed or sometimes with small lobes or angles on shoulders, toothed, white-tomentose underneath: fls. pink or rose, sometimes whitish, to 8 in. across. Swamps, Mass. to Fla. and Mo.—Here belong the large-fld. garden mallows, some of them accounted hybrids with related species.

mutabilis. COTTON-ROSE. CONFEDERATE-ROSE. Shrub or small tree: lvs. broadly ovate, lobed to half or less their depth, tomentose beneath: fls. white or pink, becoming red, to 4 in. across. China; planted in southernmost states and in the tropics.

oculiroseus. CRIMSON-EYE R. Closely resembling *H. Moscheutos* but the white fls. with a dark rose or crimson center. Salt marshes, N. Y. and N. J.

palustris: *H. Moscheutos.*

Rosa-sinensis. ROSE-OF-CHINA. CHINESE H. Shrub to 30 ft.: lvs. ovate, not lobed, toothed or nearly entire: fls. of many colors, rose-red to white, sometimes double, to 6 in. across. Asia; widely grown in all warm countries and also under glass. Var. Calleri has buff-yellow fls. crimson at base. Var. Cooperi (*H. Cooperi*) has narrow lvs. variegated with white and small scarlet fls. Var. Van Houttei has deep crimson fls. Other forms in the trade are **aurantiacus, grandiflorus** and **miniatus.**

Sabdariffa. ROSELLE. JAMAICA SORREL. Ann. or bien. to 7 ft.: st.-lvs. lobed or divided: fls. yellow, having thick red acid calices and involucels from which sauces and jellies are made in warm countries; fiber is derived from the sts. Tropics of Old World.—See *Roselle.*

schizopetalus. Shrub: lvs. ovate, not lobed, toothed: fls. long-peduncled and hanging, red or orange-red, to 3 in. across, the petals much cut and recurved, the staminal column long-exserted. E. trop. Afr.; grown in the southernmost parts of the country.

sinensis: *H. Rosa-sinensis.*

speciosus: *H. coccineus.*

syriacus (*Althæa frutex*). SHRUB-ALTHEA. ROSE-OF-SHARON. Shrub to 12 ft., much planted: lvs. 3-lobed or toothed: fls. rose or purple to white and bluish, often double, to 3 in. across. E. Asia; hardy N. There are many hort. forms, such as **albus plenus, amplissimus** with double purple-pink fls., and **pæoniflorus.**

tiliaceus (*Pariti* or *Paritium tiliaceum*). MAHOE. Shrub or tree: lvs. nearly orbicular, resembling those of the linden: fls. yellow, to 3 in. long; involucel and calyx persistent on fr. Probably Old World tropics, now widely spread.

Trionum (*H. africanus*). FLOWER-OF-AN-HOUR. Ann. to 2 ft.: lvs. deeply divided into coarsely toothed lobes: fls. sulfur-yellow or white with dark center to 3 in. across. Afr.: nat. in N. Amer.

HICKORY-NUT. The hard husk-inclosed fruit of various species of Carya (which see), characteristic of North America, and some of the species much prized. They are gathered in the wild and one of them is much planted in the South: see *Pecan.* All the hickories are readily raised from seeds (or nuts), stratified and planted in spring, or sown directly in the ground in autumn if they can be protected from rodents. Because of the tap-root, seedlings transplant with considerable loss if allowed to stand in the original nursery more than a year or so. Special strains or named varieties of hickories may be propagated by severing some of the side roots but not loosening their hold in the ground, then tieing the upper end to a stake with the severed part about level with the soil: a shoot should arise from the top. Seedlings also may be side-grafted to the desired kind. On trees well established in permanent place, the common cleft-graft is successful; the grafting is usually performed at the crown, just below the surface of the ground. The cions should be dormant and provided with a terminal bud; the work is then covered with fine earth so that the top bud protrudes, the parts having first been waxed or bandaged.

Aside from the pecan, the most prized of the hickory-nuts are the shagbark, *Carya ovata*, and the shellbark, *C. laciniosa.* Other species also produce edible nuts.

HICKSBEACHIA. *Proteaceæ.* One Australian tree, **H. pinnatifolia.** Lvs. of 18–23 stiff toothed lfts. to 9 in. long and 2 in. wide: fls. silky outside, ½ in. long, in spike-like racemes to 11 in. long: fr. globular, to 1½ in. across, orange-colored.

HICORIA: *Carya.*

HIDALGOA. *Compositæ.* Cent. American climbing shrubs with ternately cut lvs. and rather large heads of ray- and disk-fls., resembling single dahlias; one species grown out-of-doors in S. Calif.

Wercklei (*Childsia Wercklei*). CLIMBING-DAHLIA. Lvs. opposite, to 2½ in. long, climbing by the coiled petioles: heads orange-scarlet, to 2½ in. across. Costa Rica.

HIERACIUM. HAWKWEED. *Compositæ.* Many per. herbs, often stoloniferous, of the north temp. zone, with alternate or basal lvs. and panicled or occasionally solitary heads of yellow, orange or red ray- and disk-fls.; pappus of stiff usually brownish bristles.

A few hawkweeds are sometimes grown in the garden, especially in rockeries. They prosper in poor soil. Care must be exercised to keep them from spreading too much. Propagated easily from seed, also by division of the stolons. See also *Tolpis.*

amplexicaule. To 2 ft., glandular-sticky: lvs. ovate to lanceolate, toothed, the st.-lvs. clasping: heads 2–many, yellow, 1 in. or more across. S. Eu.

aurantiacum. ORANGE H. DEVILS-PAINTBRUSH. To 20 in., covered with long spreading hairs: lvs. mostly in basal tuft, oblong, nearly entire: heads clustered, 1 in. across, deep orange to flame color. Eu.; a bad weed in E. N. Amer.

bombycinum. To 1½ ft.: lvs. obovate, densely silvery-pubescent: heads ½ in. across, yellow. Spain.

Gronovii. To 3 ft., hairy: lvs. obovate or oval, toothed or entire: heads clustered, ½ in. across, yellow. Mass. to Fla. and Tex.

gymnocephalum. To 2 ft., white-pubescent: lvs. oval or oblong, slightly toothed: heads clustered, ¾ in. across, yellow. S. Eu.

lanatum. To 20 in., densely gray-tomentose: lvs. oval or ovate, nearly entire: heads clustered, 1 in. across, pale yellow. S. Eu.

marmoreum. To 1 ft., hairy: lvs. ovate-oblong, toothed: heads clustered, ¾ in. across, yellow. S. E. Eu.

paniculatum. To 3 ft., nearly glabrous: lvs. lanceolate, toothed: heads panicled, ½ in. across, yellow. N. S. to Ga. and Ala.

Pilosella. MOUSE-EAR H. Slender, to 1 ft., densely hairy: lvs. in a basal tuft, oblong, entire: heads solitary, 1 in. across, pale yellow, sometimes striped or tinged with red or purple. Eu.; nat. in E. N. Amer.

rubrum. To 1½ ft., densely woolly, resembling *H. aurantiacum.* E. Cent. Eu.

stoloniferum: a confused name.

tridentatum. To 3 ft., hairy: lvs. oblong to lanceolate, with few coarse teeth: heads clustered, to ¾ in. across, yellow. Eu.

umbellatum. NARROW-LEAVED H. To 3 ft.: lvs. lanceolate to linear, toothed: heads clustered, to 1½ in. across, golden-yellow. Eu., Asia.

venosum: To 3 ft., nearly glabrous: lvs. obovate to oval, toothed, often purple-veined: heads numerous, ½ in. across, yellow. Me. to Ga. and Neb.

villosum. SHAGGY H. To 2 ft., soft silky-pubescent: lvs. oblanceolate to ovate, nearly entire: heads to 2 in. across, bright golden-yellow, often solitary at end of sts. Eu.

HILLS-OF-SNOW: *Hydrangea arborescens* var. *grandiflora.*

HIMALAYA-BERRY. A kind of blackberry introduced into North America in recent years and grown somewhat for fruit. It is one of the many kinds of European brambles with very long scrambling more or less perennial canes, *Rubus procerus;* it is not Himalayan. The plant is rampant and viciously thorny. It is best handled on a trellis or arbor. In parts of California it is a useful fruit plant and may also be grown acceptably elsewhere when properly trained, but in general its pomological promise is not great. The plant has established itself in some places outside cultivation. Propagation and culture as for *Blackberry.*

HIPPEASTRUM. *Amaryllidaceæ.* Bulbous herbs native in the tropics of the western hemisphere, having narrow basal lvs. and red or whitish lily-like fls. borne in an umbel at top of hollow scape, the perianth-segms. united into a short tube.

Hippeastrums are grown as house-plants and out-of-doors but the bulbs must be lifted in winter. The plants bloom in spring or summer or in late winter in the greenhouse. The best soil is one composed of fibrous loam, leaf-mold and sand. They may be propagated by seeds which produce blooming plants in about two years. In gardens these plants are commonly known as Amaryllis; the common garden kinds are hybrids or variants.

equestre: *H. puniceum.*

hybridum: a name for hort. forms.

Johnsoni. An old hybrid between *H. Reginæ* and *H. vittatum* probably not now in cult., or represented by more recent crosses and variants.

puniceum (*H.* and *Amaryllis equestre*). Lvs. to 2 in. wide, after fls.: fls. red or salmon-red, lighter toward base, to 5 in. long, the tube about 1 in. long. Trop. Amer.

Reginæ (*Amaryllis Reginæ*). Lvs. to 2 in. wide, after fls.: fls. bright red with whitish star in throat, to 5 in. long, the tube to ½ in. long. Trop. Amer.

reticulatum (*Amaryllis reticulata*). Lvs. to 2 in. wide, with fls.: fls. rose-pink cross-barred with darker rose, to 4 in. long, the tube 1 in. long. Brazil. Var. **striatifolium** has lvs. with a prominent white rib.

solandriflorum. Lvs. to 2 in. wide, with fls.: fls. greenish-white, to 10 in. long, the tube 4–5 in. long. S. Amer.

vittatum (*Amaryllis vittata*). Lvs. with or after fls.: fls. striped red and white, to 6 in. long, the tube about 1 in. long. Peruvian Andes.—The usual garden forms or colors are much like this species.

HIPPOCASTANACEÆ. HORSE-CHESTNUT FAMILY. Two widely distributed genera of trees and shrubs bearing opposite digitately compound lvs., irregular polygamous fls. having 5 sepals, 4–5 petals, 5–8 stamens, superior 3-celled ovary, and leathery capsular fr. Only Æsculus is cult.

HIPPOCREPIS. *Leguminosæ.* Herbs or small shrubs with pinnate lvs. and yellow papilionaceous fls. in nodding racemes or spikes; native in Medit. region and grown sometimes in rock-gardens and borders.

multisiliquosa. Ann. to 1 ft.: lfts. in 2–7 pairs: fls. small: pods curved, breaking into 3–7 joints.

HIPPOPHAË. SEA-BUCKTHORN. *Elæagnaceæ.* Spiny shrubs or small trees covered with silvery scales, having alternate willow-like lvs., inconspicuous yellow diœcious fls. appearing before the lvs., and drupe-like frs.

Any soil is satisfactory. To insure fruit care must be taken to have a few staminate plants. Propagated by seeds sown in fall or stratified, cuttings of ripened wood in spring, root-cuttings, layers and suckers.

hybrida: a listed name.

rhamnoides. Very hardy, to 30 ft.: fr. bright orange-yellow, ¼ in. long, staying on through the winter. Eu., Asia. Var. **angustifolia** has narrow lvs. and pendulous branches. Var. **procera** grows to 50 ft.

salicifolia. To 50 ft., the branches drooping: lvs. stellate-tomentose below, dull green above: fr. yellow. Himalayas; to be planted S.

HIPPOSELINUM LEVISTICUM: *Levisticum officinale.*

HIRSUTE: with rather rough or coarse hairs.

HISPID: provided with stiff or bristly hairs.

HOARHOUND: *Marrubium.* **Black:** *Ballota nigra.* **Water:** *Lycopus.*

HOARY: covered with a close white or whitish pubescence or down.

HOBBLE-BUSH: *Viburnum alnifolium.*

HOFFMANNIA. *Rubiaceæ.* Shrubs or rarely herbs native from Mex. to S. Amer. with opposite or whorled usually colored lvs., small tubular 4-lobed fls. in axillary cymes, and fr. a small berry; a few of them are grown as foliage plants in the greenhouse. Propagated by cuttings.

discolor. To 6 in., hairy: lvs. obovate, to 6 in. long, satiny above, purple beneath: fls. red, the cymes long-stalked. Mex.

Ghiesbreghtii (*Campylobotrys Ghiesbreghtii*). To 4 ft., nearly glabrous: lvs. oblong-lanceolate, to 1 ft. long, dark velvety-green above, purple-red beneath: fls. yellow with red spot, the cymes short-stalked. Mex. Var. **variegata** has mottled lvs.

regalis. Subshrub: lvs. round-ovate, dark green above, purple-red beneath: fls. yellow, the cymes nearly sessile. Mex.

HOHERIA. *Malvaceæ.* New Zeal. trees with alternate toothed lvs., white small or medium fls. clustered or solitary in the axils, the pedicels jointed near middle, and 5 indehiscent winged carpels falling away from a central axis; grown in S. Calif.

angustifolia (*H. populnea* var. *angustifolia*). To 25 ft.: lvs. linear-oblong, to 2 in. long, spiny-toothed: fls. ⅓ in. across.

populnea. To 30 ft.: lvs. ovate, to 5 in. long, doubly toothed: fls. to 1 in. across.

sexstylosa (*H. populnea* var. *lanceolata*). To 25 ft.: lvs. lanceolate, to 5 in. long, sharp-toothed: fls. ¾ in. across.

HOLBOELLIA: see *Lardizabalaceæ.*

HOLCUS (*Sorghum*). *Gramineæ.* Tall coarse quick-growing broad-lvd. ann. and per. grasses native in warm parts of the Old World, the spikelets borne in large terminal panicles which in some species mature into heavy grain-bearing heads or tassels; grown for grain and forage, and for the sirup extracted from the stalks of *H. Sorghum* var. *saccharatus.* The species are not clearly defined and there are many forms. See *Grasses.*

caffrorum: *H. Sorghum* var.

Durra: *H. Sorghum* var.

halepensis (*Andropogon halepensis*). JOHNSON-GRASS. MEANS-GRASS. ALEPPO-GRASS. Per. to 6 ft., very leafy, with strong creeping rootstocks: lvs. to 2 ft. long and 1 in. wide: panicles loose, to 2 ft. long, the branches spreading. Medit. region but widely nat.—Grown for forage and pasture, mostly in the S.; becomes an invading weed.

lanatus: *Notholcus lanatus.*

saccharatus: *H. Sorghum* var.

Sorghum (*Andropogon Sorghum*). SORGHUM. Ann. to 12 ft. or more, often with juicy pith yielding sirup: lvs. to 2 ft. long and 2 in. wide: panicles variable, the spikelets large and broad and persistent at maturity. Probably Afr.; long cult. and the source of many races, some of which yield important grain as well as forage; one is broom-corn and one the sweet or sirup sorghum. Var. **caffrorum** (*H. caffrorum*). Kafir. Pith dry: panicles dense, oblong or cylindric, grains large. S. Afr. Var. **caudatus.** Feterita. To 14 ft.: panicles very dense, oblong, grains large, white, yellow or red. Cent. Afr. Var. **Drummondii.** Chicken-Corn. To 6 ft.: panicles to 16 in. long, the branches ascending, grains small, orange. Guinea. Var. **Durra** (*H. Durra*). Durra. Pith dry: panicles ovate, recurved, grains large. Nile region. Var. **Roxburghii.** Shallu. Panicles oblong, becoming loose, grains small. Afr., India. Var. **saccharatus** (*H. saccharatus*). Sorgho, Sweet or Sugar S. Pith juicy and sweet, employed in the making of sirup. Var. **technicus.** Broom-Corn. Panicles to 2 ft. or more long, spikelets usually awned.

sudanensis. Sudan-Grass. Ann. to 10 ft.: lvs. to 2 ft. long and ½ in. wide: panicles to 1 ft. long and 6 in. across, the branches ascending. Afr.

virgatus. Tunis-Grass. Ann.: panicles to 2 ft. or more long, very narrow and slender, spikelets awned. Afr.

HOLLY: *Ilex.* African-: *Solanum giganteum.* Mountain-: *Nemopanthus.* Sea-: *Eryngium maritimum.*

HOLLYHOCK. Two species of Althæa, *A. rosea* and *A. ficifolia,* the latter differing in its deeply lobed and somewhat fig-like leaves and probably not specifically distinct. Hollyhocks are stately hardy plants, 5–9 feet tall, well known everywhere, summer-blooming, bearing large wide-open flowers along the main axis in white, rose, red, yellowish, single and double.

The culture is very simple. The seed is usually sown in July, and the plants set where wanted the following spring or they may stand where sown. They will bloom the same year in which they are transplanted—the year following the seed-sowing. New plants should be set every two years, as they are essentially biennial. For the rust of hollyhocks, remove affected leaves promptly; do not allow diseased leaves to remain over winter, in particular remove all pustuled leaves of the low clump just before winter and again in spring; frequent thorough dusting on both surfaces of the leaf with sulfur or green-sulfur should then keep the disease in check. Clean up the garden thoroughly.

HOLMSKIOLDIA. *Verbenaceæ.* Shrubs with opposite simple lvs., tubular fls. with conspicuous colored calices borne in racemes or cymes, and drupaceous frs.; planted out-of-doors in warm climates and sometimes under glass, particularly for its large ornamental calyx.

sanguinea. Chinese-Hat Plant. To 30 ft., evergreen: lvs. ovate, to 4 in. long: fls. with red corolla 1 in. long and spreading brick-red or orange calyx to 1 in. across. Himalayan region.—Now a characteristic plant in parts of trop. Amer.

HOLODISCUS (*Sericotheca. Schizonotus*). *Rosaceæ.* W. American deciduous shrubs with alternate toothed or lobed lvs. and small whitish fls. in terminal panicles; planted for ornament.

They thrive in sunny positions in well-drained soil. Propagated by seeds, by layers, and sometimes by greenwood cuttings under glass.

discolor (*Spiræa discolor*). Rock-Spirea. To 20 ft.: lvs. ovate, to 4 in. long, white-tomentose beneath: fls. creamy-white, in panicles to 9 in. long on drooping branches. B. C. to Calif. and Mont. Var. **ariæfolius** (*Spiræa ariæfolia*) has lvs. gray-pubescent beneath.

microphyllus. To 3 ft.: lvs. elliptic, to ½ in. long, white-silky beneath: fls. in panicles to 3 in. long. Colo., Utah, Wyo.

HOLOPTELEA. *Ulmaceæ.* One large deciduous tree in India, separated from the elms by the entire lvs. and technical characters of fl. and fr. **H. integrifolia** has pubescent shoots and elliptic or obovate-oblong lvs. to 6 in. long and 5 or 7 pairs of nerves: fr. 1 in. long, elliptic or nearly orbicular, notched at end.—Adapted only to warm climates.

HOLY-GHOST-FLOWER: *Peristeria elata.*

HOMALANTHUS. *Euphorbiaceæ.* Trop. Asian and Australian trees or shrubs with alternate entire lvs., monœcious apetalous fls. in terminal racemes, and capsular frs.; sometimes grown in S. U. S. for ornament or curiosity.

populifolius (*Carumbium populifolium*). Small tree: lvs. triangular-ovate, to 6 in. long, long-stalked: racemes to 4 in. long. Ceylon to Pacific Isls.

HOMALOBUS: *Astragalus flexuosus.*

HOMALOCEPHALA. *Cactaceæ.* Segregate from Echinocactus distinguished by the different fr., which is somewhat fleshy and bursts irregularly, the plant body subglobose or depressed. One species. See *Cacti.* **H. texensis** (*Echinocactus texensis*). Usually much depressed or flattened endwise, to 12 in. broad and half as high, ribs 13–27 and very prominent, radial spines 6 or 7, central solitary and longer: fls. 2 in. or more long, bell-shaped, scarlet and orange below, pink to nearly white above. Tex., New Mex., Mex.

HOMALOCLADIUM. Ribbon-Bush. Centipede-Plant. *Polygonaceæ.* One shrub with flat articulated striate sts. that are usually leafless in the flowering stage, bearing small greenish fls. in little sessile clusters at alternate joints; true lvs. appearing mostly in the vegetative stage, ½–2½ in. long, lanceolate, often lobed at base. **H. platycladum** (*Muehlenbeckia platyclados*), from the Solomon Isls., frequently grown as a pot plant and in the open far S. for interest and curiosity: 2–4 ft. but in tropics making terete canes to 12 ft.: fr. small, red, berry-like, 5-sulcate at top.—Easily grown, sometimes standing light frost; propagated by cuttings.

HOMALOMENA. *Araceæ.* Trop. herbs with woody sts., lanceolate or oblong lvs with sheathing petioles, and unisexual fls. borne on spadices slightly shorter than the erect spathes; occasionally grown under glass for the variegated foliage. Cult. as for *Dieffenbachia.*

Wallisii (*Curmeria Wallisii*). Lvs. to 8 in. long and 3 in. wide, deep green above irregularly spotted with yellow and margined with white, glaucescent beneath, the petioles 2 in. long and channelled: spathes pale red minutely spotted with white. Trop. Amer.

HONESTY: *Lunaria.*

HONEY-BELL: *Mahernia verticillata.*

HONEY-BUSH: *Melianthus.*

HONEYSUCKLE: *Lonicera*. **Bush-**: *Diervilla*. **Cape-**: *Tecomaria capensis*. **French-**: *Hedysarum coronarium*. **Himalaya-**: *Leycesteria formosa*. **Jamaica-**: *Passiflora laurifolia*. **White Swamp**: *Rhododendron viscosum*.

HONEYWORT: *Cerinthe*.

HOOKERA: *Brodiæa*.

HOP: *Humulus*. **-Bush**: *Dodonæa cuneata*. **-Tree**: *Ptelea*.

HORDEUM. *Gramineæ*. Ann. and per. grasses in temp. regions of both hemispheres, with flat lvs. and spikelets in terminal cylindric dense spikes, awned; one species valuable for grain and forage. See *Grasses*.

jubatum. Squirrel-tail-Grass. Bien. or per. to 2½ ft.: lvs. to 5 in. long and ⅙ in. wide: spikes to 4 in. long, nodding, the slender awns to 3 in. long. N. Amer., Eu., Asia.—Sometimes grown for the abundant ornamental drooping spikes.

vulgare. Barley. Ann. to 3 ft.: lvs. to 1 ft. long and ¾ in. wide: panicles to 4 in. long, mostly erect, the stout awns to 6 in. long. Cultigen, of Old World origin. Var. **trifurcatum** is beardless.

HOREHOUND: *Marrubium*.

HORMIGO: *Triplaris americana*.

HORMINUM. *Labiatæ*. One per. herb adapted to the rock-garden, native from the Pyrenees to the Tyrol. **H. pyrenaicum**. To 1 ft.: lvs. mostly basal, ovate and toothed: fls. bluish-purple, ¾ in. long, somewhat 2-lipped, in whorls in long leafless spikes, in summer.

HORNBEAM: *Carpinus*. **Hop-**: *Ostrya*.

HORNWORT: *Ceratophyllum demersum*.

HORSE-BRIER: *Smilax rotundifolia*.

HORSE-CHESTNUT: *Æsculus*.

HORSE-RADISH. The comestible part of *Armoracia rusticana*, a deep-rooted perennial native in southeastern Europe and also run wild in this country, is the fleshy root, which is grated and employed as a relish or appetizer with meats and other foods. The plant blooms freely but does not mature seeds; it is therefore propagated by root-cuttings, which are planted in spring and the roots harvested in late autumn of the same year or for home use left in the ground until spring. By growing horse-radish as an annual crop and thoroughly cleaning the land of roots at harvesting time, the plant does not become established as a persistent dock-like weed and a more shapely tender easily managed product is obtained. Grown as a regular tilled crop on good land, the yield may be 3–5 tons more or less to the acre, of commercial roots fit for grating in machine. The usual practice of keeping a few old stools about the house for home use produces tough shapeless stringy roots.

Side roots saved from the trimmings, of the size of a lead-pencil to ¾ inch diameter, are cut to 5–8 inches long; these cuttings are tied in bundles and stored in cellar till spring, when they are set in a slanting position where the plants are to grow, in rows far enough apart (say 2½–3 feet or farther if set between rows of early-season crops as cabbage) to allow of good tillage and 10–18 inches in the row; the top of the cutting should be 3–5 inches below the surface of the ground.

HORSE-RADISH-TREE: *Moringa oleifera*.

HORSETAIL: *Equisetum*. **-Tree**: *Casuarina equisetifolia*.

HORSE-WEED: *Collinsonia*.

HORTICULTURE is a broad inclusive term covering the making and care of home gardens, market-gardens, orchards, nurseries, greenhouses, as well as the plant-raising phase of parks, estates and botanic gardens. It comprises whatever has to do with the growing of ornamentals, of vegetables, of fruits, and of plants prized for their general interest. It may constitute the way of earning a living and developing a business, at the same moment that in the fuller sense its subjects are embedded in the emotional assets of life.

It follows that horticulture cannot be measured or defined by its organized and commercial aspects alone or its importance be represented in statistics. The amateur and personal practice of it determine the extent of the trade development; and this fact will be increasingly apparent as home-making rises to higher satisfactions.

The main departments of horticulture, as defined by the plant subjects, are pomology or fruit-growing, floriculture or flower-growing, olericulture or vegetable-growing, landscape practice.

To grow the vast range of plants successfully and to defend them against insect and disease requires experience and definite knowledge. The plant resources of the earth are largely within the purview of the horticulturist, involving conceptions of plant geography, climate, adaptations. These resources afford endless opportunities in plant-breeding. It follows that the exact identification of species and varieties is an indispensable part of this field of knowledge. Horticultural subjects have been put into pedagogical form and are now effective means of elementary and higher education. Personal skill in cultivation and in technique is essential to success and real satisfactions; yet horticulture and gardening are much more than the growing of plants. See *Garden*.

HOSACKIA. *Leguminosæ*. American herbs or rarely subshrubs with pinnate lvs. and yellow or reddish papilionaceous fls. in axillary umbels; by some authors retained in Lotus and differing in technical characters.

gracilis (*Lotus formosissimus*). Sts. weak, herbaceous, to 1 ft. long: lfts. 3–7, obovate or oblanceolate: fls. to ¾ in. long, rose, upper petal yellow. Wash. to Calif.

HOSTA (*Funkia. Niobe*). Plantain-Lily. *Liliaceæ*. Per. herbs with thick durable roots, large clumps of broad or at least not greatly elongated basal lvs. and blue, lilac or white fls. in racemes or spikes terminating the scape or peduncle, the perianth-segms. partially united.

Plantain-lilies are hardy and of easy cultivation, doing well in moist shady places, making neat attractive foliage clumps until cut down by cold weather. Propagated by division of the stools, and only seldom by seeds for some of the kinds do not produce capsules.

H. cærulea and *H. plantaginea* make shallow clumpy rootstocks with large scars, and the other kinds have more fibrous but thick roots from the crown or from short rootstocks. The long white wax-like flowers of *H. plantaginea* are very fragrant, appearing in late summer and autumn; the others have short lavender-purple ("blue") or lilac flowers, sometimes almost white, drooping or soon becoming so, and little if at all odorous. *H. cærulea* differs from all others in the flower being suddenly enlarged or widened in its upper half; the other lilac or blue kinds have a gradually widened flower-tube.

albo-marginata: *H. japonica* var.

cærulea (*F. ovata*). BLUE P. To 3 ft.: lvs. to 9 in. long and 5 in. wide, cordate at base, deep green: fls. lavender-purple (blue), striped with lighter color, to 2 in. long, in summer, the perianth-tube narrowly furrowed-cylindrical for about half its length and then suddenly bulging or shouldered into an urn-shaped bloom: seeds freely. Japan, China, Siberia.

decorata. BLUNT P. To 2 ft.: lvs. oval, to 6 in. long, obtuse or only very short- and abruptly pointed, about 5-nerved either side midrib, white-margined, petioles winged: scape exceeding foliage, winged: fls. rather dark lilac, to 2 in. or more long, drooping, in summer: seeds freely. Origin undetermined.

Fortunei. TALL-CLUSTER P. To 2 ft. and more, the scapes much taller than foliage: lvs. to 5 in. long and 3½ in. broad, heart-shaped at base, glaucous or blue-green as if glaucous, with 10–12 nerves either side midrib, short-petioled: fls. pale lilac, 1½ in. long, in late spring and early summer. Probably Japan. Var. gigantea is a form with larger longer-petioled lvs., rather larger fls. that stand less high above the foliage.

japonica (*H. lancifolia. H. lanceolata*). NARROW-LEAVED P. To 2 ft., slender, the scapes exceeding the foliage: lvs. narrow, to 4 in. long and 2 in. wide, tapering to both ends, green, with 3 or 4 nerves either side midrib, the petioles slender and scarcely winged: fls. lilac or pale lavender, to 2 in. long, in summer and autumn; seldom if at all fruitful in cult. Japan. Var. albo-marginata has lvs. edged with white. Var. fortis is a common form in cult. differing in greater size and vigor, larger and leaf-like bracts on scape, nerves 6 or 7, petioles winged, blooms in summer. Var. tardiflora has prominently acuminate-pointed lvs., short margined petioles, autumnal fls. in a condensed often branched cluster; probably not in cult. in N. Amer., the plant so named being *H. japonica* itself.

lanceolata: *H. japonica.*

lancifolia: *H. japonica.*

ovata: *H. cærulea.*

plantaginea (*F. grandiflora. F. subcordata*). FRAGRANT P. To 2½ ft., the scapes exceeding the foliage: lvs. to 10 in. long and 6 in. wide, cordate at base, green, nerves either side midrib 7–9: fls. tubular, ascending, white, fragrant, to 5 in. long, late summer and autumn. Japan, China.

robusta: a name of inexact application, sometimes meaning *H. undulata.*

Sieboldiana (*F. glauca*). SHORT-CLUSTER P. Scapes mostly shorter than foliage: lvs. 10–15 in. long and 6–10 in. broad, cordate, long-petioled, usually very glaucous, many-nerved either side midrib: fls. many, slender, faint lilac, conspicuously drooping, spring and early summer, in a close raceme. Japan.

subcordata: *H. plantaginea.*

undulata. WAVY-LEAVED P. To 2½ ft., stout, the scapes much exceeding foliage and leafy: lvs. ovate, 6 in. long and 3 in. broad, narrowed toward base, sharp-pointed, curved, margins more or less undulate, striped and splashed lengthwise with cream-color or white: fls. about 2 in. long, pale lavender. Origin undetermined.—The supposed green-lvd. form is probably *H. Fortunei.*

HOTBED is a frame or box that has artificial heat and a transparent covering and in which plants are grown. It differs from a coldframe in having artificial bottom heat. This bottom heat is supplied by fermenting organic matter, hot water or steam in pipes underneath the bed, and hot air conducted in horizontal flues. Formerly fermenting horse manure was the heating agency, but with the lessened supply of it and the development of mechanical devices the mechanical agencies are now mostly employed. Information on such devices may be obtained from dealers in gardening equipment and from recent bulletins.

The hotbed is covered with sash of which the normal or standard size is 3 feet wide and 6 feet long. These sashes are laid crosswise the box or frame. The standard size of frame is 6 feet wide and 12 feet long. A "frame," therefore, accommodates four sashes. However, the frame may be of any length desired. This frame is ordinarily made of boards, and the back of it is 3 or 4 inches higher than the front, so that the sashes slope to the sun. It is customary to have a space of 6 to 10 inches between the ground and the sash on the lower or front side. The area or location in which the frames are set should be protected from cold and prevailing winds by a rising slope, a high board fence, a building, hedge, or other obstruction. If the frame yard is near the main buildings, it is much more accessible in rainy or snowy times, and the plants are likely to have better care. Water should also be at hand.

When to start a hotbed depends on the kinds of plants to be grown, the time one wishes to gain, and something, also, on the character of the heat. The hardier the plant the earlier it can be started. In the latitude of New York, from the first to the middle of March is the usual time for starting a hotbed. In this bed are sown seeds of early flowers and such vegetables as cabbage, cauliflower, tomato. In the raising of plants in the hotbed, it is essential that they do not become "drawn" or "leggy." To prevent this, they must be given plenty of room, thorough ventilation on all pleasant days, and not too great heat. It is well to transplant them once or twice before they are finally set in the field, particularly if they are started, in New York, as early as the first or middle of March. When transplanted, they can be set in another hotbed or in a coldframe; but it is important that the succeeding frames in which they are set should not be very much colder than the one in which they grew, else they may become stunted. It is well, however, to transplant them into a gradually cooler and freer atmosphere to harden them off, that they may go into the open ground without danger.

On pleasant days, raise the sash at the upper end 1 or 2 inches, or if the sun shines brightly and the wind does not blow, give even more air; and eventually strip off the sashes entirely. It is important that the plants are not kept too close and grown too soft. It is usually advisable to sow cabbage, lettuce and hardy plants in different frames from tomatoes and other tender things, in order that the proper requirements may be given to each. At night the hotbeds (at least early in the season) need more protection than the glass sash. It was formerly the custom to use thick rye-straw mats to cover them, but it is now common practice to use straw matting or other fabric purchased of carpet dealers. This is rolled out on the sashes at night in one or two thicknesses; and if the weather is sharp, board shutters, the size of the sash, may be laid on top.

One must not expect to gain as much time in the crop as one gains in the starting of the seeds: that is, if seeds are started two months ahead of the normal season, one will not gain two months in the ripening of the crop. Ordinarily, one cannot expect to gain much more than one-half the time, if the plants are transplanted to the field from the hotbed.

Some plants may be grown to maturity in the hotbed, as lettuce and radishes. After hotbeds have been emptied of their plants, the sashes may be stored away, and the frames employed for the growing of a crop of melons or cucumbers.

HOTEIA: *Astilbe.*

HOTTENTOTS - BREAD: *Testudinaria elephantipes.*

HOULLETIA. *Orchidaceæ.* Epiphytes native in trop. Amer. with 1-lvd. pseudobulbs and fls. in racemes, the sepals and petals similar, the lip clawed; for cult. see *Orchids.*

odoratissima. Lvs. to 16 in. long and 3 in. wide: fls. 2½ in across, in 6–9-fld. racemes to 16 in. high; sepals and petals chocolate-brown; lip white, Aug.–Sept. Colombia.

HOUNDS-TONGUE: *Cynoglossum.*

HOUSELEEK: *Sempervivum*

HOUSE PLANTS are such as are capable of being readily and satisfactorily grown in a residence, for home adornment and decoration. The care of house plants is window-gardening, although porch- and window-boxes outside the building may not strictly be a part of it inasmuch as the purpose is exterior rather than domestic embellishment.

The growing of house plants becomes practically a question of proper window space. The essentials to be taken into consideration, before the attempt is made, is whether the place has sufficient sunlight, whether temperature can be depended on and controlled, whether the air will be too dry, and the room free from coal and illuminating gas and dust. The air of a living-room is likely to be that of a desert, as to moisture; whereas the plants one commonly desires to grow in it are those requiring a more or less humid climate. Gas leaks soon cause foliage to shed.

The house garden may occupy an entire window or set of windows, or it may consist simply of a jardinière, or a few choice pot-plants on a stand. Expensive arrangements are by no means necessary, nor is a large collection. The plants and flowers themselves are the main consideration, and a small collection well cared for is better than a large one that is not kept in good condition. The window-box in the room will be seen near at hand, however, so may be more or less ornamental in character. The sides may be covered with ornamental tile held in place by molding, or a light lattice-work of wood. But a neatly made and strong box of stout pine of a length corresponding to the width of the window, about 10 inches wide and 8 deep, answers quite as well as a costlier receptacle. A zinc tray of a size to fit into the wooden box may be ordered of the tinsmith. It tends to keep the soil from drying out so rapidly. This is provided with a false wooden bottom, with cracks for drainage, 2 inches above the real bottom of the tray. The plants will then have a vacant space below them into which drainage water may pass. Such a box may be thoroughly watered as the plants require, without danger of the water running on the floor. Of course, a faucet should be provided at some suitable point on a level with the bottom of the tray, to permit of its being drained every day or so if the water tends to accumulate. It would not do to allow the water to remain long; specially should it never rise to the false bottom, as then the soil might become too wet.

Some persons attach the plant box to the window, or support it on brackets below the window-sill; but a preferable arrangement is to support it on a low and light stand of suitable height provided with rollers. It may then be drawn back from the window, turned around from time to time to give the plants light on all sides, or turned with the attractive side inward as may be desired.

The plants are often set directly in the soil; but if they are kept in pots they may be rearranged to suit the pleasure. Larger plants to stand on shelves or brackets may be in porous earthenware pots; but the smaller ones which are to fill the window-box may be placed in heavy paper pots. The sides of these are flexible, and the plants in them, therefore, may be crowded close together with great economy in space. When pots are spaced, damp sphagnum or other moss among them will hold them in place, keep the soil from drying out too rapidly, and at the same time give off moisture.

The window for winter plants should have a southern, southeastern or eastern exposure. Plants need all the light they can get in the northern winter, especially those expected to bloom. The window should be tight-fitting. Shutters and a curtain are an advantage in cold weather.

The plants should have a certain regularity in conditions. It is trying on them, and often fatal to success, to be snug and warm one night and in a temperature only a few degrees above freezing the next. Some plants live in spite of it, but they cannot be expected to prosper to their best. Those persons whose rooms are heated with steam, hot water or hot air will have to guard against keeping rooms too warm fully as much as too cool. Rooms in brick dwellings that have been warm all day, if shut up and made snug in the evening, often keep warm over night without heat except in the coldest weather. Rooms in frame dwellings, and exposed on all sides, soon cool down. If the living-rooms are too dry for plants, the bow-window may be set off from the room by glass doors; one then has a miniature conservatory. A pan of water on the stove or on the register and damp moss among the pots may provide the necessary humidity.

From time to time the foliage will need cleansing to free it from dust. A bath-tub provided with a ready outlet for the water is an excellent place for this purpose. The plants may be turned on their sides and supported on a small box above the bottom of the tub. Then they may be freely syringed without danger of making the soil too wet. It is usually advisable not to wet the flowers, however, especially the white waxen kinds, like hyacinths. The foliage of Rex begonias should be cleansed with a piece of dry or only slightly moist cotton or soft cloth; but if the leaves can be quickly dried off by placing them in the open air on mild days, or moderately near the stove, the foliage may be syringed.

Plants suitable for the winter window-garden mostly belong to the groups that florists grow in their medium and cool houses. The former are given a night temperature of about 60°, the latter about 50°. In each case the temperature is 10° to 15° higher for the day time. Five degrees of variation below these temperatures is allowable without any injurious effects; even more may be borne, but not without more or less check to the plants. In bright sunny weather the day temperature may be higher than in cloudy and dark weather. The plant material suitable for winter window-gardens is really extensive if one desires to search for it.

The watering of house plants, as of other plants, requires caution and good judgment, and it is impossible to give rules . Conditions that hold with one grower are different from those of another. Give one good watering at the time of potting, after which water should be withheld until the plants really need it. If, on tapping the pot, it gives out a clear ring, it is indication that water is needed. In the case of a soft-wooded plant, just before the leaves begin to show signs of wilt is the time for watering. When the plants are taken up from the ground, or when they have their roots cut back in repotting, gardeners rely, after the first copious watering, on syringing the tops two or three times each day, until a new root growth has started, watering at the roots only when really necessary. Plants that have been transferred into larger pots grow without the extra attention of syringing, but those from the borders, that have had the roots mutilated or shortened, may be placed in a cool shady spot and be syringed often. One soon becomes familiar with the wants of individual plants, and can judge closely as to need of water. All soft-wooded plants with large leaf surface need more water than hard-wooded plants, and one in luxuriant growth more than one that has been cut back or become defoliated. When plants are grown in living-rooms, moisture must be supplied from some source, and if no arrangement has been made for having a moist air the plants should be syringed often. Be careful not to over-water when plants are dormant or in their resting period.

Syringing with plain water is often practiced by gardeners. It has two general offices: to clean the plants of pests or of dirt; to check evaporation or transpiration from the plant itself. Gardeners look on water as a good insecticide if it can be thrown on the plants somewhat forcibly by means of a syringe or pump, or by the hose, as it washes off the insects and drowns many of them. The water should be applied in a fine and somewhat forcible spray. Care should be taken that the plant is not torn or bruised. The red-spider is one of the most serious pests on house plants, and, in a dry season, on those about the lawn. It thrives in a dry atmosphere. It usually lives on the under sides of the leaves. Syringing the plants frequently keeps the pest in check. Thrips and slugs on rose bushes are usually kept in check if one can spray or syringe the plants frequently. Syringing to check transpiration from the foliage is useful with plants recently transplanted. The same is true with cuttings. In syringing plants, it is well to take care that the ground does not become too wet; otherwise the plant may suffer at the root. In the house, plants should rarely be syringed except when the weather is bright, so that they may soon dry off. The plant should not go into the night with soaking foliage. With plants in the house, it is necessary to keep the leaves dry most of the time that fungi may not breed; this is true of carnations when liable to attacks of the rust.

Common winter window-garden plants for an average night temperature of 60°

Upright flowering plants.—Abutilon, browallia, calceolaria, begonia, bouvardia, euphorbia, scarlet sage, calla, heliotrope, fuchsia, Chinese hibiscus, jasmine, single petunia, swainsona, billbergia, freesia, geranium, cuphea.

Upright foliage plants.—Ribbon-bush, *Cycas revoluta*, *Dracæna fragrans* and others, palms, canna, *Farfugium grande*, achyranthes, ferns, araucaria, epiphyllum (zygocactus), pandanus or "screw-pine," pilea, *Ficus elastica*, grevillea, aspidistra.

Climbing plants.—*Asparagus plumosus*, *Cobœa scandens*, smilax, Japanese hop, Madeira vine (Boussingaultia), *Senecio mikaniodes* (parlor ivy), calacinum. See also list below.

Low-growing, trailing, or drooping plants.— These may be used for baskets and edgings. Flowering kinds are: Sweet alyssum, lobelia, *Fuchsia procumbens*, mesembryanthemum, russelia, oxalis, *Mahernia verticillata* or honey-bell.

Foliage plants of drooping habit.—Vinca, *Saxifraga sarmentosa*, Kenilworth ivy, tradescantia or wandering jew, *Festuca glauca*, othonna, *Isolepis gracilis*, English ivy, selaginella, and others. Some of these plants flower freely, but the flowers are small and of secondary consideration.

Plants for an average night temperature of 50°

Upright flowering plants.—Azalea, cyclamen, carnation, chrysanthemum, geranium, Chinese primrose, stevia, marguerite or Paris daisy, single petunia, camellia, ardisia (berries), cineraria, violet, hyacinth, narcissus, tulip, the Easter lily when in bloom, and others.

Upright foliage plants.—Pittosporum, palms, aucuba, euonymus (golden and silvery variegated), araucaria, pandanus, dusty miller.

Climbing plants.—English ivy, maurandia, senecio or parlor ivy, lygodium (climbing-fern).

Drooping or trailing plants.—Flowering kinds are sweet alyssum, *Mahernia verticillata*, russelia and ivy geranium.

The practiced window-gardener will find many more plants than these as observation and experience multiply. Many kinds of cacti and other condensed or succulent plants are interesting and adaptable subjects for window-gardening; see *Cacti, Succulents.*

Up to this point the instructions have applied to the winter window-garden. Summer window-gardening may now be considered; this kind of home-gardening is particularly suited to those who live in the crowded city, where the want of other space makes the window-garden the only one possible.

The summer plants are grown in a window-box like that described for the winter garden except, of course, it must fit the outside rather than the inside of the window opening. Since there is more or less cramping of roots, it is necessary to make the soil richer than would be required were the plants to grow in the garden. The most desirable soil is one that does not pack hard like clay, nor contract much when dry, but remains porous and springy. Such material is found in the potting soil used by florists, and it may be obtained from them. Often it is desirable to have at hand a box of sharp sand for mixing with the soil, to make it more porous and to prevent baking. Some persons pot the plants and then set them in the window-box, filling the spaces between the pots with moist moss. Others plant directly in the soil. The former method, as a general rule, is to be preferred in the winter window-garden, the latter in summer.

Useful plants for the summer window-garden are those of drooping habit, such as lobelias, tropæolums, *Othonna crassifolia*, Kenilworth ivy, ice-plant, sweet alyssum. Such plants may occupy the front row, while back of them may be the erect-growing plants, as geraniums, heliotropes, begonias. The suitability of the plants depends much on conditions. In the following lists certain kinds are of climbing or trailing habit and may be trained about the sides of the window. Others will be found among the climbing plants. For shady situations the main dependence is on plants of graceful form or handsome foliage; while for the sunny window the selection may be of blooming plants. For the shady side of the street, the more delicate kinds of plants may be used. (1) For full exposure to the sun, it is well to choose the more vigorous-growing kinds. In such position, suitable plants for drooping are: tropæolums, passifloras, the single petunias, sweet alyssum, lobelias, verbenas, mesembryanthemums. For erect-growing plants: geraniums, heliotropes. (2) If the position is shaded, the drooping plants might be of the following: tradescantia, Kenilworth ivy, senecio or parlor ivy, sedums, moneywort, vinca, smilax, lygodium or climbing-fern. Erect-growing plants are dracænas, palms, ferns, coleus, centaurea, spotted calla, aspidistra, sansevieria, aucuba, and others.

When the plants have filled the earth with roots, it is desirable to give the surface of the soil among the plants a very light sprinkling of bone-dust or a thicker coating of rotted manure from time to time in the summer; or instead of this, a watering with weak liquid manure about once a week. This is not necessary, however, until the growth shows that the roots have about exhausted the soil.

In autumn the box may be placed on the inside of the window. In this case it is desirable to thin out the foliage somewhat, shorten some of the vines, and perhaps remove some of the plants. It is also well to give a fresh coating of rich soil. Increased care will be necessary in watering, since the plants have less light than previously, and, moreover, there may be no provision for drainage.

A very different kind of summer window-gardening is the florist's window-box. Leading city plantsmen prepare such boxes with plants grown or chosen for the purpose, many of them of stiff habit and durable character to withstand difficult conditions and requiring the minimum of care. These boxes are usually very attractive.

HOUSTONIA. *Rubiaceæ.* North American small herbs, usually tufted, with opposite entire lvs. and small, white, blue or purple fls. in spring and summer, the corolla funnelform or salverform and 4-lobed.

A few species are transferred to the wild- or rock-garden where they thrive in moist and often partly shaded positions, and *H. cærulea* in sun. Propagated by division.

angustifolia. Per. to 2 ft.: lvs. linear, to 1½ in. long, often clustered: fls. white or purplish, ⅙ in. long, in terminal cymes. Ill. to Fla. and Tex.

cærulea. BLUETS. Per. to 7 in., tufted: lvs. oblanceolate, ½ in. long: fls. violet, blue or white with yellow eye, to ½ in. across, solitary. N. S. to Ga. and Mo.

filifolia: *H. floridana.*

floridana (*H. filifolia*). Per. to 1½ ft., much branched: lvs. linear or thread-like, to ¾ in. long: fls. purple, ⅙ in. long, in loose leafy cymes. S. Fla.

purpurea. Per. to 1½ ft.: lvs. ovate or ovate-lanceolate, to 2 in. long: fls. purple or lilac, ⅓ in. long, in terminal cymes, in spring. Md. to Ga. and Miss.

serpyllifolia. Per. with prostrate sts. to 10 in. long: lvs. orbicular, to ⅓ in. long: fls. deep blue, ½ in. across, solitary. Pa. to Ga. and Tenn.

HOUTTUYNIA. *Saururaceæ.* One per. herb to 3 ft., native from the Himalayas to Japan. **H. cordata.** Rootstock creeping: lvs. alternate, ovate, 2–3 in. long, heart-shaped at base, buckwheat-like: fls. in dense spike about ½ in. long, subtended by white corolla-like 4-parted spathe.—Grown in moist situations. Propagated by division or seeds.

HOVEA. *Leguminosæ.* Australian shrubs with alternate simple lvs., blue or purple papilionaceous fls. mostly in axillary clusters or racemes, and inflated pods; may be grown out-of-doors in mild climates. Propagated by seeds in spring under glass.

Celsi (*H. elliptica*). To 10 ft.: lvs. elliptic to lanceolate, to 3 in. long, pale and pubescent beneath: fls. blue, to ½ in. long.

elliptica: *H. Celsi.*

pungens. To 2 ft.: lvs. linear or lanceolate, to 1 in. long, pungent-pointed, margins revolute: fls. ½ in. across.

trisperma. To 2 ft.: lvs. ovate to linear, to 3 in. long, pubescent beneath: fls. large.

HOVENIA. *Rhamnaceæ.* One or two deciduous shrubs or trees from China, Japan and the Himalayas. **H. dulcis.** JAPANESE RAISIN-TREE. To 30 ft.: lvs. alternate, ovate, to 7 in. long, toothed: fls. greenish, in many-fld. racemes: fr. about ¼ in. across, the stalks becoming fleshy and reddish and club-shaped and sometimes eaten.—It thrives in sandy loam. Propagated by seeds, root-cuttings and cuttings of mature wood under glass. It has been recommended as a fruit-plant; hardy well N.

HOWEA. *Palmaceæ.* Two handsome and much planted unarmed monœcious ringed feather-palms of Lord Howe Isl. east of New S. Wales, commonly known as Kentias: lvs. long and gracefully curving, with many slender long-pointed pinnæ: spadices from the lower axils or nodes where lvs. have recently fallen, with a long peduncle-like part, long and slender and unbranched except perhaps at very base, soon becoming pendent; fls. in 3's in prominent pits, the central one pistillate and developing later; stamens 30–100; ovule basal: fr. ellipsoid-oblong, nearly or quite 1½ in. long, dry and somewhat fibrous outside, stigmatic point terminal, the enlarged perianth small and cup-like; seed 1. For cult. see *Palm.*

Belmoreana (*Kentia Belmoreana*). Medium-sized tree: lvs. 6 or 7 ft. long, strongly arching; pinnæ crowded, about 1 in. broad at middle, very sharp-pointed, standing in an upward or erect position on the rachis for part their length, not punctate or scaly underneath: spadix solitary, flowering part 2–3 ft. or more long; stamens 30–40.

Forsteriana (*Kentia Forsteriana. Denea Forsteriana*). Larger and stouter tree, to 60 ft. and more: lvs. mostly larger, standing upright or horizontal, not over-arching; pinnæ not crowded, mostly somewhat broader, hanging, on mature plants punctate-scaly on lower surface under a lens: spadices 3–6 side by side at the node on a short base included in the spathe, the flowering part usually less than 2 ft. long; stamens 80–100.

HOYA. *Asclepiadaceæ.* Many climbing shrubs with thick opposite lvs., wheel-shaped fls. in axillary clusters with a star-shaped crown, and milkweed-like frs.: native from E. Asia to Australia, one grown under glass and in window-gardens.

Hoyas should be grown in a moist warm house and should not be forced in winter. Propagated by cuttings in spring and layering.

carnosa. WAX-PLANT. Root-climbing to 8 ft. or more: lvs. ovate-oblong, to 4 in. long: fls. white with pink center, ½ in. across, fragrant, in summer. China, Australia. Var. **variegata** has variegated lvs.

HUAMUCHIL: *Pithecellobium dulce.*

HUCKLEBERRY: *Gaylussacia.* Garden: *Solanum nigrum.* Hairy: *Vaccinium hirsutum.* He-: *Lyonia ligustrina.*

HUERNIA. *Asclepiadaceæ.* Several species of small succulent leafless per. herbs in S. and trop. Afr. and 1 in Arabia, one species somewhat planted in Calif.: sts. angled and toothed: fls. in cymes or solitary at or near the base of young shoots, mostly campanulate and 5-lobed limb, with crown inside.

Penzigii. Sts. 3 in. or so high and ¾ in. or less thick and spreading teeth nearly ½ in. long: fls. 1–5, blackish-purple, about ¾ in. across and somewhat less in length, roughish with pimples. Nile Land.

HUFELANDIA. *Lauraceæ.* A few trees in Mex., Cent. Amer. and W. Indies, allied to Persea but differing in technical characters, as anthers 2-celled rather than 4-celled; one, the anay, has been intro. experimentally in S. Fla. as a possible fruit plant.

Anay. Tree to 60 ft. and more: lvs. alternate, oval, to 8 in. long: fls. small, in somewhat pubescent axillary panicles: fr. somewhat like an avocado in looks and flavor, to 6 in. long, narrow-pyriform, glossy purplish-black. Guatemala.

HUGELIA: *Gilia densifolia.*

HUISACHE: *Acacia Farnesiana.*

HUMATA. *Polypodiaceæ.* Small trop. Asian rhizomatous ferns similar to Davallia and grown like the members of that genus, with leathery triangular or oblong entire or pinnatifid lvs., the sterile less cut than fertile, and sori borne near the margins of segms.

Tyermannii. BEARS-FOOT-FERN. Rootstock creeping, white-scaly: lvs. to 6 in. long, 3–4-pinnatifid. Cent. China.—Sometimes grown in the coolhouse.

HUMBLE-PLANT: *Mimosa pudica.*

HUMEA. *Compositæ.* Australian herbs or shrubs with small heads of disk-fls. borne in dense corymbs or panicles; pappus none.

Humeas are heavy feeders and need plenty of moisture. The seed may be sown from the first of July till September. In the North the young plants should be kept nearly dry and in a cool house in winter in preference to frames, as the foliage is likely to drop in the moisture of the latter. They may be planted in the garden in June. When in 10-inch pots they are very ornamental for the conservatory or piazza.

elegans. Bien. to 6 ft.: lvs. ovate-lanceolate or oblong, to 10 in. long, wrinkled, sweet-scented: fls. in loose graceful drooping panicles, ruby-red, rose, pink or brownish-red.

HUMULUS. HOP. *Moraceæ.* Rough-stemmed tall-twining herbs with opposite broad lobed lvs. and small not showy fls.: staminate and pistillate fls. on different plants, the former small and in loose panicles; pistillate fls. aggregated in heads which in two species become cones or "hops" from the growth of the bracts. Hardy plants grown for ornament and also for the hops employed in brewing, native in N. Amer., Eu. and Asia. Species probably 3.

americanus. Per.: lvs. mostly 5–11-lobed, the lobes attenuate and closely serrate, the terminal lobe about twice as long as broad. N. Amer., probably native in central or western part, its separateness from *H. Lupulus* not yet determined; supposed parent of the Oregon Cluster hop.

japonicus. Ann., or grown as such: lvs. deeply 5–7-lobed, strongly serrate: fr. a loose aggregation of nutlets not much enlarging in maturity and not making true hops, the scales narrow and attenuate. China and Japan.—Grown from seeds for porches and screens.

Lupulus. Common or European H. Per.: lvs. mostly 3–5-lobed, the lobes about as broad as long and short-pointed, coarsely toothed. Eurasia, and escaped or nat. in N. Amer.—Source of most of the hopyard vars.; propagated by cuttings of underground sts.

HUNNEMANNIA. *Papaveraceæ.* A Mexican per. herb, much like Eschscholzia, grown as an ann. in the flower-garden. **H. fumariæfolia.** Mexican Tulip-Poppy. Golden-Cup. To 2 ft.: lvs. ternately dissected, glaucous: fls. yellow, to 3 in. across: fr. linear, to 4 in. long.—Requires a warm sunny exposure. Propagated by seeds.

HUNTLEYA. *Orchidaceæ.* Epiphytes with solitary fls. borne on long stalks in axils of lvs., the sepals and petals similar, the lip narrowed into a claw having a fringed callus. For cult, see *Orchids.*

Burtii (*Batemannia* and *Zygopetalum Burtii*). Lvs. to 1½ ft. long and 2 in. wide: fls. about 3½ in. across, the sepals and petals brown spotted with yellow and at base yellow, the lip brown, white at base, the fringes of callus light purple, Aug. Costa Rica. Var Wallisii has larger fls.

HURA. *Euphorbiaceæ.* Trop. American trees with milky juice which is a powerful irritant, alternate simple lvs., monœcious fls. without petals, and capsular frs.

Sometimes planted for ornament in tropical regions. It thrives on a light loamy soil; propagated by cuttings as well as by seeds. Sometimes grown under glass as juvenile specimens.

crepitans. Sandbox-Tree. Great tree to 100 ft., the branches often spiny: lvs. broadly ovate, toothed, to 2 ft. long: fls. red: fr. about 3 in. across, many-ribbed, splitting forcibly into parts when ripe. W. Indies, Costa Rica, S. Amer.

HUTCHINSIA. *Cruciferæ.* Little ann. and per. draba-like herbs of Eu. and S. W. Asia, one of which is employed in alpine- and rock-gardening: lvs. pinnate or entire: fls. small, white, in close racemes: fr. or silicle short-oblong or oval.

alpina (*H. Auerswaldii*). Per., tufted, 1–4 in. high: lvs. basal, 1 in. or less long, petioled, pinnatisect into oval or oblong lobes: fls. pure white, spring and summer. Mts., Eu.

Auerswaldii: *H. alpina.*

HYACINTH: *Hyacinthus.* **Giant Summer-:** *Galtonia candicans.* **Grape-:** *Muscari.* **Pine-:** *Clematis Baldwinii.* **Star-:** *Scilla amœna.* **Water-:** *Eichhornia crassipes.* **Wild-:** *Brodiæa lactea.*

HYACINTHUS. Hyacinth. *Liliaceæ.* Bulbous herbs with narrow basal lvs. and red, blue, white or yellow fls. in racemes terminating the scape, the perianth-segms. partially united into a tube. Only one species is in general cult., and this is popular both for the open garden and for forcing under glass for late winter bloom.

amethystinus. To 6 in.: fls. light blue, nodding. Spain.

azureus (*Muscari azureum*). To 8 in.: lvs. channelled, glaucous: fls. small and Muscari-like but perianth-segms. flaring rather than incurved, blue, in a dense short spike. Medit. region.

candicans: *Galtonia candicans.*

orientalis. Common H. To 1½ ft.: lvs. to 1 ft. and more long and 1 in. across: fls. of many colors, about 1 in. long, often double, in early spring. Greece to Asia Minor. Var. **albulus,** Roman H., is smaller and earlier, with white to light blue fls.

plumosus: *Muscari comosum* var. *monstrosum.*

romanus (*Bellevalia romana*). To 1½ ft.: lvs. weak and prostrate, linear-lanceolate: fls. greenish-white shaded blue at base, about ⅓ in. long, in 20–30-fld. conical racemes, in spring. Medit. region.

The hyacinth is hardy in the United States and Canada, giving its bloom in early spring with the mid-season tulips. Strong carefully grown and selected bulbs must be employed if best results are to be obtained. The bulbs may be planted, in the North, September and October, the bottom of the bulb being 5 or 6 inches below the surface in properly prepared well-drained ground; they may be planted about 5 to 6 inches apart. Mulch thoroughly for the winter if the place does not become naturally covered with autumn leaves. The bulbs may remain permanently if the leaves are allowed to grow after bloom and they are not crowded out by grass and weeds; or if the bed becomes too thick and weak, the bulbs may be lifted and the better ones replanted, preferably in another place.

For winter bloom, bulbs are set in pots or boxes in October, in a porous soil of loam and leaf-mold, lightened with sand if necessary to keep it friable and open; usually the bottom of the pot or box is covered with clinkers, charcoal or other material for drainage; and if boxes are employed they must have holes or cracks in the bottom. The tip of the bulb is allowed to show at the surface of the soil or to be barely covered. A large bulb is sufficient for a 5-inch pot; specially made hyacinth pots are deeper than the ordinary kind and preferable. The pots are placed in a coldframe or similar place to allow the bulbs to root, being covered a few inches deep with soil or sifted coal ashes. In six to eight weeks the roots will have formed and the pots or boxes may be brought into a room with a temperature of about 50°. Here they are allowed to remain till the shoots are vigorous, stocky and dark green, when they may be brought to the living-room, some of them perhaps being left in the intermediate temperature to provide succession. If the bulbs are not well rooted when brought in from the frame, so that the roots fill the pot, the results will not be satisfactory. After the bloom is past the bulbs are thrown away.

Hyacinths are sometimes bloomed in glasses, that are made for the purpose and may be had of dealers in garden supplies. There is a flange at the top to hold the bulb; the glass is kept filled with water up to the bottom of the bulb. It is well to place a few pieces of charcoal in the bottom of the glass as it is supposed to keep the water sweet. The glasses are set aside in a dark cool place for the bulbs to form roots the same as in soil, although quicker results are usually obtained with water culture. Roots having reached the bottom of the glass, receptacles are brought to an intermediate temperature and handled as for potted plants.

Propagation of the hyacinth is by means of bulblets or offsets from the old bulb, which should give blooming bulbs in two or three years. The production of bulblets is stimulated by variously cutting the bulb, but the home gardener would better depend on the commercial supply.

HYALIS: *Ixia.*

HYBRID, in its historic application, is a product of a sex-cross between two or more species. In a broader but less desirable usage, it is the product of any cross independently of whether the parents are species or marked varieties. In a looser way the word is sometimes employed for plants that appear to be intermediate between given or assumed parents, even without record that the cross has been made or that it is possible, as if it were merely another word for variation. For exact description and record it is desirable that the word be employed as definitely as are the words species, variety, forma, in systematic horticulture and botany. A half-hybrid is a sex-product between a species and a variety of another species; a cross-breed between plants of one species. A sex-product of plants of two genera is a bigener or bigeneric hybrid.

HYDASTYLUS: *Sisyrinchium.*

HYDATICA: *Saxifragra leucanthemifolia.*

HYDRANGEA. *Saxifragaceæ.* Mostly deciduous shrubs, sometimes vines climbing by means of rootlets, or even tree-like, with showy white, pink or blue fls. in terminal panicles or cymes in summer, some of the marginal fls. usually enlarged and sterile and in some cult. races all the blossoms are of this form: lvs. medium-sized or large, opposite and simple, variously toothed or lobed: native in N. and S. Amer. and Asia.

Hydrangeas require a rich porous and somewhat moist soil; they bloom mostly freely in full sun but may thrive also in partial shade. They should be pruned rather severely in the fall or early spring. The hardy species are propagated by green cuttings in summer under glass; the tender ones by cuttings taken at any time from vigorous young wood, usually in late winter. Suckers can be separated from some species, while layering is occasionally employed in others. *H. quercifolia* is increased by little suckers or "root pips"; *H. paniculata* easily from young wood taken in June and planted under glass. Seeds may be employed when available.

arborescens. Erect, to 10 ft.: lvs. ovate, to 8 in. long, glabrous or slightly pubescent beneath: fls. white, in rounded or globular clusters to 6 in. across, the sterile ones few, June–July. N. Y. to Fla. and La. Frequently planted, especially var. **grandiflora**, HILLS-OF-SNOW, with large clusters of clear white sterile fls. Var. **cordata** (*H. cordata*) has broad lvs. cordate at base. Var. **sterilis** has all fls. sterile.

Belzoni: *H. macrophylla* var. *cærulea.*

Bretschneideri (*H. vestita* var. *pubescens. H. pekinensis*). To 10 ft.: lvs. ovate to oblong-ovate, to 5 in. long, pubescent beneath: fls. white, the sterile becoming purplish, in corymbs to 6 in. across, July. N. China.

cinerea. To 6 ft.: lvs. elliptic to ovate-oblong, to 6 in. long, gray-tomentose beneath: fls. white, in corymbs to 8 in. across, the sterile fls. few. N. C. to Ga. and Ala.

cordata: *H. arborescens* var.

Hortensia, hortensis: *H. macrophylla.*

japonica: *H. macrophylla* var. *rosea.*

macrophylla (*H. opuloides. H. hortensis. H. Hortensia*). To 12 ft.: lvs. elliptic to broad-ovate, to 8 in. long, often nearly as broad, glabrous or slightly pubescent beneath, more or less thick and shining: fls. blue, pink or white, in flat or roundish cymes to 8 in. across, June–July. China, Japan.—Grown in the open in mild regions and often forced in the greenhouse. There are many cult. vars. as: **cærulea** (*H. Belzoni*), fls. deep blue with blue or white ray-fls.; **Hortensia**, fls. all sterile, pink to blue; **mandshurica** (*H. opuloides* var. *cyanoclada*), fls. rose, mostly sterile; **otaksa** (*H. otaksa*) is dwarfer with mostly sterile fls.; **rosea** (*H. japonica*), sterile fls. pink, in flat clusters; **Veitchii** (*H. Hortensia* var. *japonica rosea*), sterile fls. deep rose.

nivea: *H. radiata.*

opuloides: *H. macrophylla.*

otaksa: *H. macrophylla* var.

paniculata. Shrub or tree-like, to 30 ft.: lvs. elliptic to ovate, to 5 in. long, pubescent beneath: fls. whitish, in a panicle to 15 in. long, the sterile ones few, long-pedicelled, changing to purplish, Aug.–Sept. China, Japan. Var. **grandiflora** is the common outdoor hydrangea with large long panicles in which many or most of the fls. are sterile, large, persistent and showy. Var. **præcox**, fls. about six weeks earlier than type.

pekinensis: *H. Bretschneideri.*

petiolaris (*H. scandens. H. volubilis*). Tall root-climber reaching to 50 ft. or more but making a straggling partly decumbent bush when support is not provided: lvs. broad-ovate, to 4 in. long, nearly glabrous: fls. in nearly circular open clusters to 10 in. across, the few white sterile fls. on very long pedicels, June–July. Japan.

quercifolia. To 6 ft., young parts brown-tomentose: lvs. to 8 in. long and nearly as broad, strongly 3–5-lobed, whitish-tomentose beneath: fls. in a panicle to 1 ft. long, with many white sterile fls. turning purple, June. Ga. to Fla. and Miss. but hardy well N.

radiata (*H. nivea*). Erect, to 8 ft.: lvs. ovate to ovate-lanceolate, to 5 in. long, white-tomentose beneath: corymbs rounded, to 5 in. across, with white sterile fls. about the margin. N. C., S. C.

Sargentiana. To 6 ft.: lvs. ovate or ovate-oblong, to 10 in. long, hairy: fls. pale violet, in flat corymbs to 6 in. across, with white sterile fls., July–Aug. China.

scandens: *H. petiolaris.*

serrata (*H. Thunbergii*). To 6 ft.: lvs. elliptic to lanceolate, to 4 in. long, more or less pubescent, dull: fls. blue or white, in flat corymbs to 3 in. across, with few small sterile fls., July–Aug. Japan, Korea. Var. **rosalba**, sterile fls. white and pink. Var. **stellata** (*H. stellata, H. opuloides* var. *stellata*), sepals narrow and pointed.

stellata: *H. serrata* var.

strigosa. To 8 ft.: lvs. oblong-ovate to lanceolate, to 7 in. long, stiff-hairy beneath: corymbs to 6 in. across, the sterile fls. white or purplish, Aug. China. Var. **macrophylla** has lvs. to 1 ft. long and cymes to 8 in. across.

Thunbergii: *H. serrata.*

vestita var. **pubescens:** *H. Bretschneideri.*

volubilis: *H. petiolaris.*

xanthoneura. To 15 ft.: lvs. elliptic, to 7 in. long, slightly pubescent beneath: fls. white, in convex corymbs to 6 in. across, with sterile fls. W. China. Var. **setchuenensis** has lvs. more hairy below. Var. **Wilsonii** has oblong lvs. shining above.

HYDRANGEA-VINE: *Schizophragma hydrangeoides.*

HYDRASTIS. *Ranunculaceæ.* Low per. herbs with palmately lobed lvs., small solitary fls. with 3 petal-like sepals, no petals and numerous stamens, and fr. a head of crimson berries; 1 species in Japan, 1 in E. N. Amer., the latter grown or gathered for the roots which have medicinal properties.

Hydrastis requires rich moist soil with plenty of leaf-mold. For commercial plantations lath coverings are often used or trees to simulate the native woods conditions. Propagated by seeds or by division of roots.

canadensis. GOLDENSEAL. ORANGE-ROOT. To 1 ft., the rootstock thick and yellow: basal lvs. to 8 in. across, 5–9- lobed, st.-lvs. 2, the upper one sessile under the fl.: fls. greenish-white, ½ in. across. Conn. to Ga. and Kans.

HYDRIASTELE. *Palmaceæ.* Small or monotypic genus of Australian unarmed monœcious feather-palms, one of which is considerably planted: trunk solitary, slender, ringed: infl. below the crown at the base of the sheath-column; spathe compressed, of 2 valves; fls. in 3's on a much branched spadix, the middle one pistillate, but frequently 1 or 2 of them are absent; stamens 6: fr. small and thin-shelled, sitting in the cup of the enlarged perianth, 1-seeded. Grown in S. Fla. See *Palm.*

Wendlandiana (*Kentia Wendlandiana*). In cult. in American tropics usually seen as a small tree to 20 ft., but taller in native places, with attractive crown of arching lvs. and conspicuous widely branched clusters of fr. at top of woody trunk: lvs. 4–5 ft., green but lighter or glaucescent beneath; pinnæ to 20 or 30 in. long and 2–3 in. broad at middle, with very strong side-nerves, at the apex variously notched or jagged: fr. ½ in. diam., ribbed, apiculate, reddish.—This plant has been confused with the Cluster palm, *Actinophlœus* (*Ptychosperma*) *Macarthuri*, which, however, normally has several trunks, softer foliage, pinnæ much shorter and not conspicuously side-ribbed, fr. taper-pointed. It has been planted under the name *Kentia singaporensis.*

HYDROCHARIS. *Hydrocharitaceæ.* Aquatic floating herbs with long-stalked round lvs.

and white unisexual fls.; grown in the aquarium. Propagated by cuttings or long runners and naturally by the winter-buds which form in the fall.

Morsus-ranæ. FROGS-BIT. Roots fine and silky: lvs. 2 in. across, heart-shaped at base: fls. nearly or quite 1 in across. Eu., E. Asia.

HYDROCHARITACEÆ. FROGS-BIT FAMILY. Aquatic herbs of 14 genera over the world, with mostly unisexual fls. from a bracted spathe, having perianth of 3 calyx-like and 3 petal-like parts, 3–12 stamens, and inferior 1-celled ovary. Some of them are submerged plants, the fls. often coming to the surface on long very slender stalks; others are floating. Elodea, Hydrocharis, Stratiotes and Vallisneria are sometimes grown in ponds and aquaria.

HYDROCLEYS. *Butomaceæ.* Three Brazilian aquatic herbs with basal lvs. and large fls. with 3 leathery sepals and 3 fugacious petals.

Of easy cultivation in ponds and aquaria. When grown in tubs, soil should be put in to two-thirds the depth and then filled with water. Propagated by division of rooting sts.

nymphoides (*Limnocharis Humboldtii*). WATER-POPPY. Lvs. floating or sometimes erect, broadly ovate, glossy above: fls. yellow, 2 in. across, in clusters.—Tender N.

HYDROCOTYLE. *Umbelliferæ.* Creeping per. herbs with nearly or quite orbicular sometimes peltate palmately lobed or veined lvs. usually crenate, small white fls. in little umbels, and strongly compressed frs.; one is sometimes grown for carpet-bedding and ground-cover in moist locations. Propagated by seeds, cuttings or layers.

rotundifolia. Rooting at nodes: lvs. nearly circular, 1 in. across, toothed or lobed, shining. Trop. Asia, Afr.

HYDROLEA. *Hydrophyllaceæ.* Ann. or per. herbs widely distributed in warm regions, having alternate entire lvs. and wheel-shaped fls. mostly in corymbs; one sometimes planted in warm countries.

spinosa. Per. to 4 ft., sticky-pubescent: lvs. oval or oblong, to 5 in. long: fls. blue, ½ in. across, fragrant. Trop. and subtrop. Amer.

HYDROPHYLLACEÆ. WATER-LEAF FAMILY. About 18 herbaceous genera of wide distribution, especially in N. Amer., and a few of the plants woody, some of them grown for ornament. Family characterized by the mostly alternate lvs., regular fls. with corolla united, 1- or 2-celled superior ovary with 2 separate or united styles, and fr. a dehiscent caps.; the related Polemoniaceæ has a single 3-lobed style and 3-celled ovary. Genera in cult. are Emmenanthe, Hydrolea, Hydrophyllum, Nemophila, Phacelia, Romanzoffia, Wigandia.

HYDROPHYLLUM. WATER-LEAF. *Hydrophyllaceæ.* N. American bien. and per. woods herbs with large, thin, pinnately or palmately divided lvs. and rather small bell-shaped white, blue or purple fls. in cymes, the stamens exserted; sometimes transplanted to the wild-garden.

canadense. Per. to 2½ ft.: lvs. to 1 ft. across, palmately 5–9-lobed, toothed: fls. greenish-white or purplish. Vt. to N. C. and Ky.

virginianum. Per. to 3 ft.: lvs. to 10 in. long, pinnately divided into 5–7 toothed segms.: fls. white or violet-purple. Que. to S. C. and Kans.

HYDROSME. *Araceæ.* Herbs native in trop. Afr., E. Indies and Cochin-China, differing only in seed characters from Amorphophallus, which see.

Rivieri (*Amorphophallus Rivieri*). DEVILS-TONGUE. To 4 ft.: lvs. to 4 ft. across, the petioles spotted with brown and white; lf.-blade pedately decompound into broad pointed segms.: spathes ovate, 1 ft. long, green spotted with white and purplish toward the wavy margins. Cochin-China.

HYLOCEREUS. *Cactaceæ.* Climbing and often epiphytic, the long sts. commonly 3-angled or 3-winged and bearing aerial roots, mostly with short spines: fls. nocturnal, very large, with large leaf-like scales but no spines or wool, white or red. Mex., Cent. Amer., W. Indies, N. S. Amer. *H. undatus* is much cult., and has run wild in trop. countries; greenhouse plant in the N.

calcaratus (*Cereus calcaratus*). Climber, joints 2 in. wide more or less, green, strongly 3-winged, margins lobed, areoles with 2–4 white bristles and no spines: fls. not described. Costa Rica.

costaricensis (*Cereus trigonus* var. *costaricensis*). Vine, joints to 4 in. wide, usually 3-angled, spines 2–4 and short and at first usually with 2 white bristles: fls. above 1 in. long, very fragrant, pure white, reddish outside. Costa Rica.

Lemairei (*Cereus Lemairei*). Tall vine, 3-angled and rooting on one side, about 1 in. diam., spines usually 2 and very short: fls. above 10 in. long, white, reddish outside, odorous, stigma-lobes divided. Trinidad, Tobago.

monacanthus (*Cereus monacanthus*). Sts. 3-angled, margins undulate, spine commonly 1 (sometimes 2) at an areole: fls. funnelform, about 11 in. long and 7 in. broad, white, greenish outside and rose-colored at base. Panama, Colombia.

ocamponis (*Cereus ocamponis*). Strongly 3-angled, glaucous, spines 5–8 and needle-like: fls. to 12 in. long and broad, white, greenish outside, Probably Mex.

stenopterus (*Cereus stenopterus*). Weak vine, joints 1½ in. broad, not glaucous, ribs 3 and thin, spines 1–3 and yellow: fls. 4 in. or more long, reddish-purple. Costa Rica.

triangularis (*Cereus triangularis:* see *H. undatus*). Vine, sharply 3-angled, to 1½ in. broad, with many aerial roots, spines mostly 6–8 and needle-like: fls. 8 in. or more long, white. Jamaica.

tricostatus: *H. undatus.*

undatus (*Cereus undatus. C. tricostatus. C. triangularis* of hort.). Long-clambering, ribs usually 3 and thin, margins undulate, spines 1–3 and small: fls. to nearly 1 ft. long, white, yellowish-green outside. Tropics and subtropics.—Much cult., and one of the plants best known as night-blooming cereus.

HYMENÆA. *Leguminosæ.* Trop. American trees, one species yielding a resin which is used for medicinal purposes and as a varnish and also furnishing valuable timber. **H. Courbaril.** WEST INDIAN LOCUST. To 60 ft.: lvs. of 2 oblong to ovate lfts.: fls. white, in terminal panicles: pods thick and woody, rough, to 5 in. long.—Propagated by seeds or by cuttings over bottom heat.

HYMENANTHERA. *Violaceæ.* Stiff shrubs with alternate or clustered simple lvs., small bisexual or unisexual fls. and fr. a small berry; grown out-of-doors in S. Calif. Propagated by seeds, cuttings and layers.

chathamica. Tall shrub: lvs. leathery, lanceolate, to 5 in. long, sharp-toothed: fls. diœcious, in clusters along the branches: berry white. New Zeal.

crassifolia. To 5 ft., sometimes prostrate, much branched: lvs. leathery, linear-obovate, to 1½ in. long, entire or margins wavy: fls. few in the axils: berry purplish. New Zeal.

dentata. Tall much branched shrub: lvs. leathery, oblong to linear, to 1½ in. long, remotely toothed: fls. solitary or in 2's: berry purplish. Australia.

novæ-zelandiæ. To 10 ft.: lvs. leathery, ovate or obovate, to 4 in. long, usually wavy-toothed: fls. diœcious, clustered: berry purplish. New Zeal.

obovata. To 12 ft.: lvs. obovate, to 2 in. long, entire or slightly toothed: fls. diœcious, solitary or few: berry purplish. New Zeal.

Traversii. Small tree: lvs. leathery, obovate, to 1 in. long, margins reflexed, covered below with silvery-white tubercles: fls. solitary, very small. New Zeal.

HYMENOCALLIS. Spider-Lily. *Amaryllidaceæ.* American summer-flowering bulbous herbs with linear or strap-shaped basal lvs. and mostly white fls. borne in umbels terminating the solid scapes, the perianth with narrow segms. and long tube, the stamens united into a cup-like crown below.

Of easy cultivation in warm climates where the bulbs will bloom year after year if given good care. Propagated by offsets.

americana. To 2½ ft.: lvs. to 2½ ft. long and 2½ in. broad: fls. with tube 4 in. or more long and linear segms. about same length; crown toothed, 1 in. long, the filaments of the stamens to 2 in. long. Trop. Amer.

calathina (*Pancratium calathinum. Ismene calathina*). Basket-Flower. To 2 ft.: lvs. to 2 ft. long and 2 in. broad: fls. with tube to 4 in. long and lanceolate segms. about same length; crown funnel-shaped, the lobes fringed, 2 in. long, the filaments of stamens ½ in. long. Andes of Peru and Bolivia.—Probably the most frequent kind in cult.

caribæa. Lvs. 1 ft. and more long and 3 in. wide, shining: fls. fragrant, the tube to 3 in. long and linear segms. about same length; crown toothed, about 1 in. long, the filaments of stamens to 2 in. long. W. Indies, Fla.

macrostephana. Lvs. to 3 ft. long and 3 in. wide: fls. with tube 3 in. long and linear-lanceolate segms. somewhat longer; crown large, 2 in. long, the filaments of stamens 1 in. long. Probably a hybrid.

occidentalis. Lvs. to 1½ ft. long and 1¼ in. wide, glaucous: fls. with tube to 4 in. long and linear segms. about same length; crown to 1¼ in. long. S. C. to Mo. and Miss.

rotata. Stoloniferous: lvs. 1½ ft. long and 1 in. or less wide: fls. with tube to 4 in. long and linear segms. of about same length; crown rotate, 1 in. long, the filaments of stamens 1½ in. long. N. C. to Fla.

HYMENODIUM: *Elaphoglossum crinitum.*

HYMENOSPORUM. *Pittosporaceæ.* One Australian evergreen shrub or tree to 50 ft., planted out-of-doors in S. U. S. **H. flavum.** Lvs. obovate, entire, to 6 in. long: fls. yellow and prominent, 1½ in. long, the petals united into a tomentose tube about 1 in. long, borne in loose terminal umbel-like panicles: caps. 1 in. long, the seeds winged. Cult. as for *Pittosporum.*

HYMENOSTEMMA: *Chrysanthemum Fontanesii.*

HYMENOXYS CALIFORNICA: *Baeria aristata.*

HYOPHORBE. Pignut Palm. *Palmaceæ.* Three monœcious unarmed feather-palms of the Mascarene Isls., the 2 species cult. having swollen or bulging trunks: stocky trees as usually seen in cult., with the pinnæ close together on the rachis, the lf.-sheaths surrounding the trunk at the top: infl. below the lf.-crown, the branches many and making a bushy mass; spathes ascending club-shaped before anthesis: fls. very small, 3–7 together on the strands of which the lowermost 1 or 2 are pistillate; stamens 6: fr. a small purplish oblong drupe 1 in. or less long; albumen homogeneous. Sometimes planted in the open in S. Fla.; *H. Verschaffeltii* is the commoner species in the U. S. See *Palm.*

amaricaulis (*Areca speciosa*). Bottle Palm. To 60 ft. in native isls., the trunk stout and tapering to a bottle-like neck at top: petiole mostly 1 ft. or more long on mature tree; pinnæ short, about 18 in. or less long, with prominent side nerves.

Verschaffelti (*Areca Verschaffelti*). Spindle Palm. To 30 ft., trunk bulging above the base or near the middle and tapering to top: petiole about 3–4 in. long; pinnæ mostly 2 ft. or more long, only the midvein prominent.

HYOSCYAMUS. Henbane. *Solanaceæ.* Coarse erect or prostrate herbs with alternate coarsely toothed or deeply cut lvs., axillary funnel-shaped fls., the upper ones forming a leafy cluster or spike, and capsular frs.; native in the Medit. region, a few grown for ornament and medicinal purposes.

albus. Sticky-hairy ann. or per.: lvs. nearly orbicular, coarsely triangular-lobed, all petioled: fls. pale yellow, green or purple at base, nearly sessile.

aureus. Sticky-hairy per. with decumbent branches: lvs. cordate-ovate, sharply triangular-lobed, all petioled: fls. yellow, violet at base, peduncled.

niger (*H. pictus*). Bien. or ann. to 2½ ft., with spindle-shaped roots: lvs. oblong, to 8 in. long, irregularly cut and toothed, clasping or lower petioled: fls. greenish-yellow veined with purple, sessile: caps. inclosed in the large calyx.

pictus: *H. niger.*

HYPERANTHERA: *Moringa.*

HYPERICACEÆ. St. Johns-Wort Family. The species planted in our territory are herbs or subshrubs native in many countries, characterized by opposite or whorled pellucid-dotted or black-dotted simple mostly entire lvs.: fls. polypetalous, mainly yellow, cymose or solitary, regular and bisexual, with many stamens commonly united into clusters, styles separate: fr. a caps. By some authors the family is united with Guttiferæ. Only the genera Ascyrum and Hypericum require attention here.

HYPERICUM. St. Johns-Wort. *Hypericaceæ.* A large genus of yellow-fld. herbs and small shrubs furnishing much ornamental material for planting in borders, shrubberies or the rock-garden, with the characteristics of the family.

The hypericums are of easy cultivation, some of them preferably in shady situations. Propagated by seeds, greenwood cuttings under glass in summer and the low kinds by division and suckers. Most of the species are hardy to New York and New England, unless otherwise noted.

adpressum. Per. or subshrub to 2 ft.: lvs. oblong or lanceolate, to 2 in. long: fls. ½ in. across, in terminal cymes; styles 3. Mass. to Ga. and La.

Androsæmum. Tutsan. Shrub to 3 ft., semi-evergreen: lvs. ovate to ovate-oblong, to 4 in. long, whitish beneath: fls. 1 in. across, solitary or in cymes; styles 3. Eu., W. Asia; for central or southern states.

Arnoldianum. Hybrid between *H. lobocarpum* and *H. galioides.*

Ascyron. Per. to 6 ft.: lvs. ovate-oblong, to 5 in. long: fls. to 2 in. across, in few-fld. cymes. Que. to Pa. and Kans., N. Eu., N. Asia.

aureum. Shrub to 4 ft.: lvs. ovate-oblong to oblong, bluish-green, to 3 in. long: fls. to 2 in. across, solitary or few together; styles 3. S. C. to Tenn. and Tex.

Buckleii. Subshrub to 1 ft.: lvs. obovate, to ¾ in. long: fls. 2 in. across, 1–3 together; styles 3. N. C. to Ga.; to be planted far S.

calycinum. Shrub to 1 ft., evergreen: lvs. ovate-oblong to oblong, to 4 in. long, glaucous beneath: fls. to 2 in. across, solitary or in cymes; styles 5. S. E. Eu., Asia Minor.

canariense. Shrub to 15 ft.: lvs. oblong-lanceolate, to 3 in. long: fls. to 1¼ in. across, in panicles. Canary Isls.; far S. or Calif.

chinense. Shrub to 2 ft., semi-evergreen: lvs. oblong, to 3 in. long: fls. 2 in. across; styles 5-parted at apex. China; to be planted far S.

cistifolium. Subshrub to 3 ft., stoloniferous: lvs. oblong to linear-lanceolate, to 3 in. long, revolute: fls. ½ in. across, in loose cymes; styles 3. Ohio to Ill. and Ark.

Coris. Subshrub to 1 ft.: lvs. narrow-linear, to 1 in. long: fls. ¾ in. across, in cymes; styles 3. Eu.; adapted only to southern states.

densiflorum. Shrub to 6 ft., evergreen: lvs. linear-oblong to linear, to 2 in. long: fls. to ½ in. across, in dense cymes; styles 3. N. J. to Fla. and Tex.

elatum. Shrub to 4 ft.: lvs. ovate-oblong, to 3 in. long: fls. to 1½ in. across, in panicles; styles 3. Canary Isls., Madeira; for southernmost states.

elegans. Per. to 1 ft.: lvs. ovate-lanceolate, to 1 in. long: fls. to 1 in. across, in terminal panicles. Cent. Eu. to Altai Mts.

empetrifolium. Shrub to 1 ft., evergreen: lvs. linear, to ¾ in. long: fls. to ¾ in. across, in panicles. S. E. Eu., Asia Minor; to be planted far S.

floribundum. Shrub to 6 ft.: lvs. lanceolate-elliptic, 1½ in. long: fls. to 2 in. across, in many-fld. panicles; styles 3. Canary and Madeira Isls.; far S. or Calif.

fragile. Dwarf subshrub: lvs. ovate, ⅙ in. long: fls. in cymes. Greece; not hardy N.

galioides. Shrub to 3 ft.: lvs. linear, to ¾ in. long: fls. ½ in. across, solitary or in cymes; styles 3. Del. to Fla. and Tex.

gracile: listed name.

Henryi: *H. patulum* var.

hircinum. Shrub to 3 ft.: lvs. ovate-lanceolate, to 2½ in. long: fls. 1½ in. across, solitary or clustered; styles 3. Medit. region; to be planted in central regions or S.

hirsutum. Hairy per. to 2 ft.: lvs. oval or oblong, 1 in. or more long: fls. in panicles. Eu., N. Asia.

Hookerianum. Shrub to 6 ft., evergreen: lvs. ovate to oblong, to 4 in. long: fls. 2½ in. across, in terminal cymes; styles 5. Himalayas; to be grown far S.

hyssopifolium. To 1 ft.: lvs. linear, about 1 in. long: fls. ½ in. across, in panicles. S. Eu.; to be planted far S. or in Calif.

inodorum. Arching shrub, the branchlets 2-edged: lvs. ovate or ovate-oblong, to 2 in. long: fls. 1 in. across, in dense few-fld. cymes. Caucasus.

japonicum. Decumbent per.: lvs. ovate or oval, to ½ in.: fls. ¼ in. across, in cymes. Japan to Australia and India; to be tried far S.

Kalmianum. Shrub to 3 ft., evergreen: lvs. oblong-linear or oblanceolate, to 2½ in. long: fls. 1 in. across, in few-fld. cymes; styles 5. Que. to Ill.

Kotschyanum. Herb to about 8 in.: lvs. oblong: fls. in cymes or panicles. Asia Minor; not hardy N.

lobocarpum. Shrub to 6 ft.: lvs. narrow-oblong, to 2¾ in. long, revolute: fls. ½ in. across, in terminal panicles; styles 5. N. C., Tenn.

lysimachioides. Shrub to 4 ft.: lvs. ovate, to 1½ in. long: fls. to 1½ in. across, in loose cymes; styles 5. Himalayas; for southern states.

montanum. Per. to 2 ft.: lvs. oblong to ovate, to 2 in. long: fls. ½ in. across, in cymes. Eu.; probably not hardy N.

Moserianum. GOLD-FLOWER. Hybrid between *H. patulum* and *H. calycinum:* shrub to 2 ft.: lvs. ovate, to 2 in. long: fls. to 2½ in. long, solitary or in cymes; styles 5. Var. **tricolor** has lvs. edged with red and white.

nudiflorum. Shrub to 3 ft.: lvs. oblong to oblong-lanceolate, to 2¼ in. long: fls. pale yellow, to ¾ in. across, in loose cymes on leafless peduncles; styles 3. N. C. to Fla. and Ala.

nummularium. Subshrub: lvs. round, ½ in. long: fls. ¾ in. across, in terminal cymes. Pyrenees; probably not hardy N.

oblongifolium: *H. patulum* var.

olympicum. Subshrub to 1 ft.: lvs. oblong-lanceolate, to 1½ in. long: fls. 2½ in. across, in terminal cymes; styles 3. S. E. Eu., Asia Minor; for the far S.

orientale. Per. to 1 ft.: lvs. obovate- to linear-oblong, to 1 in. long: fls. 1 in. across, in terminal cymes. Asia Minor; for the S.

patulum. Shrub to 3 ft., evergreen: lvs. ovate-lanceolate to oblong, to 2½ in. long: fls. to 2 in. across, solitary or in cymes; styles 5. Japan. Var. **Henryi** is a vigorous form with larger lvs. and fls. Var. **oblongifolium** (*H. oblongifolium*), lvs. to 4 in. long, bluish beneath. Var. **uralum** (*H. uralum*), lvs. 1 in. long, fls. 1 in. across.

perforatum. Per. to 2 ft.: lvs. oblong to linear, to 1 in. long: fls. to 1 in. across, in terminal cymes; styles 3. Eu.; nat. in N. Amer.

polyphyllum. Per., the sts. ascending: lvs. elliptic-linear, ⅓ in. long: fls. to 2 in. across, in terminal cymes. Cilicia; not hardy N.

prolificum. Shrub to 5 ft., evergreen: lvs. narrowly oblong, to 3 in. long: fls. to ¾ in. across, in cymes; styles 3. Ont. to Ga. and west.

pulchrum. Per. to 2 ft.: lvs. ovate, ½ in. long: fls. to ¾ in. long, in panicles. Eu.

repens. Prostrate per.: lvs. oblong to linear-oblong, ⅓ in. long: fls. 1 in. across, in terminal cymes. S. E. Eu., Asia Minor; not hardy N.

reptans. Prostrate shrub, the sts. rooting: lvs. elliptic-oblong, ½ in. long: fls. to 1¾ in. across, solitary; styles 5. Himalayas; stands only far S.

Scouleri. Per. to 1½ ft.: lvs. oblong to ovate, to ¾ in. long: fls. 1 in. across, in cymes; styles 3. B. C. to Mont.

tomentosum. Per., the sts. ascending: lvs. ovate, to ¾ in. long, woolly: fls. to ¾ in. across, in corymbs. Eu.

uralum: *H. patulum* var.

HYPHÆNE. *Palmaceæ.* African fan-palms and 1 in W. India, often with widely branched trunks, unarmed except perhaps on petiole, diœcious, spadices among the lvs., fls. in pits on thick stiff branches of the infl., stamens 6: fr. oblong, ovoid or obovoid, sometimes obscurely lobed, 2–3 in. long, woody outside but more or less fleshy inside: species 28 as now understood; the distinctions be-between them lie largely in the frs., and it is not always possible to distinguish the plants accurately in the juvenile state, and it is not known whether the plants in this country are correctly named. The species so far intro. thrive in protected places in S. Fla. For cult. see *Palm.*

crinita. Trunk forked: lvs. bright green or at first with a whitish bloom that soon disappears, divided into several or many segms., roughish on margins and nerves above: fr. obovoid or pear-shaped, narrowed to base, short-pedicelled, upwards of 2 in. long; seed 1 in. or more long, globose. S. Afr.

natalensis. Trunk forked: fr. broadly top-shaped, flat on top, very little contracted at base, obtusely 3-angled, shining chestnut-colored or somewhat purplish, about 2 in. long and thick. Natal.

Schatan. More or less soboliferous, trunk simple or becoming branched: lf.-blade about 2 ft. across lengthwise; segms. acuminate-pointed, rigid, minutely scaly; petiole spiny or armed on margin: fr. variable, mostly obovoid and with a truncate or slightly convex top, short-pedicelled, about 2 in. long. Madagascar.

thebaica. Egyptian Doum Palm. To 20 or 30 ft., commonly forked but sometimes simple: lvs. nearly orbicular, stiff, the blade 2–2½ ft. long, cut to middle or deeper into 20 or more strong midribbed acuminate segms.; petiole strongly armed: fr. variable, mostly obliquely ovoid or oblong, 3 in. more or less long, the fibrous part giving the plant the name "gingerbread palm." Nile region.

HYPOCALYMMA. *Myrtaceæ.* Shrubs native in W. Australia, with opposite lvs. and fls. in axillary pairs or few-fld. clusters; petals 5; stamens numerous, shorter than petals.

robustum. To 3 ft., glabrous: lvs. linear or linear-lanceolate, to 1 in. long, stiff: fls. pink. Planted in Calif.

HYPOCHŒRIS. Cats-Ear. *Compositæ.* Herbaceous annuals and perennials with mostly basal, toothed or cut lvs. and solitary or clustered yellow heads of ligulate fls.; pappus plumose. Sometimes grown in the wild-garden. Propagated by seeds or division.

bijuga: hort. name, probably *H. uniflora.*

glabra. Ann. to 16 in., glabrous: lvs. spatulate, oblong, to 5 in. long: heads about ½ in. long, yellow, fls. scarcely longer than involucre. Eu.; nat. in W. N. Amer.

radicata. Per. to 2 ft.: lvs. sharp-toothed or lobed-white-hairy: heads solitary, deep yellow, fls. longer than involucre. Medit. region.

uniflora. Per. to 1½ ft., hairy: lvs. oblong-lanceolate: heads mostly solitary, about 1 in. long, yellow, fls. longer than involucre. Mts. of Eu.

HYPOLEPIS. *Polypodiaceæ.* Mostly trop. ferns of both hemispheres, with creeping rhizomes, 2–4-pinnate lvs., and sori in the sinuses of lf. and covered by its reflexed margin. Allied to Cheilanthes; sometimes grown under glass.

tenuifolia. Lvs. to 3 ft. long and 2 ft. wide, 4-pinnate into wavy-toothed segms., on brown stalks to 2 ft. long. New Zeal., Australia, Pacific Isls.

HYPOXIS. Star-Grass. *Amaryllidaceæ.* Small herbs with rootstocks or corms, grass-like basal lvs. and rather small fls. on few-fld. scapes, the perianth-segms. distinct. Of simple cult. in the wild-garden or border in dry soil. Propagated by division.

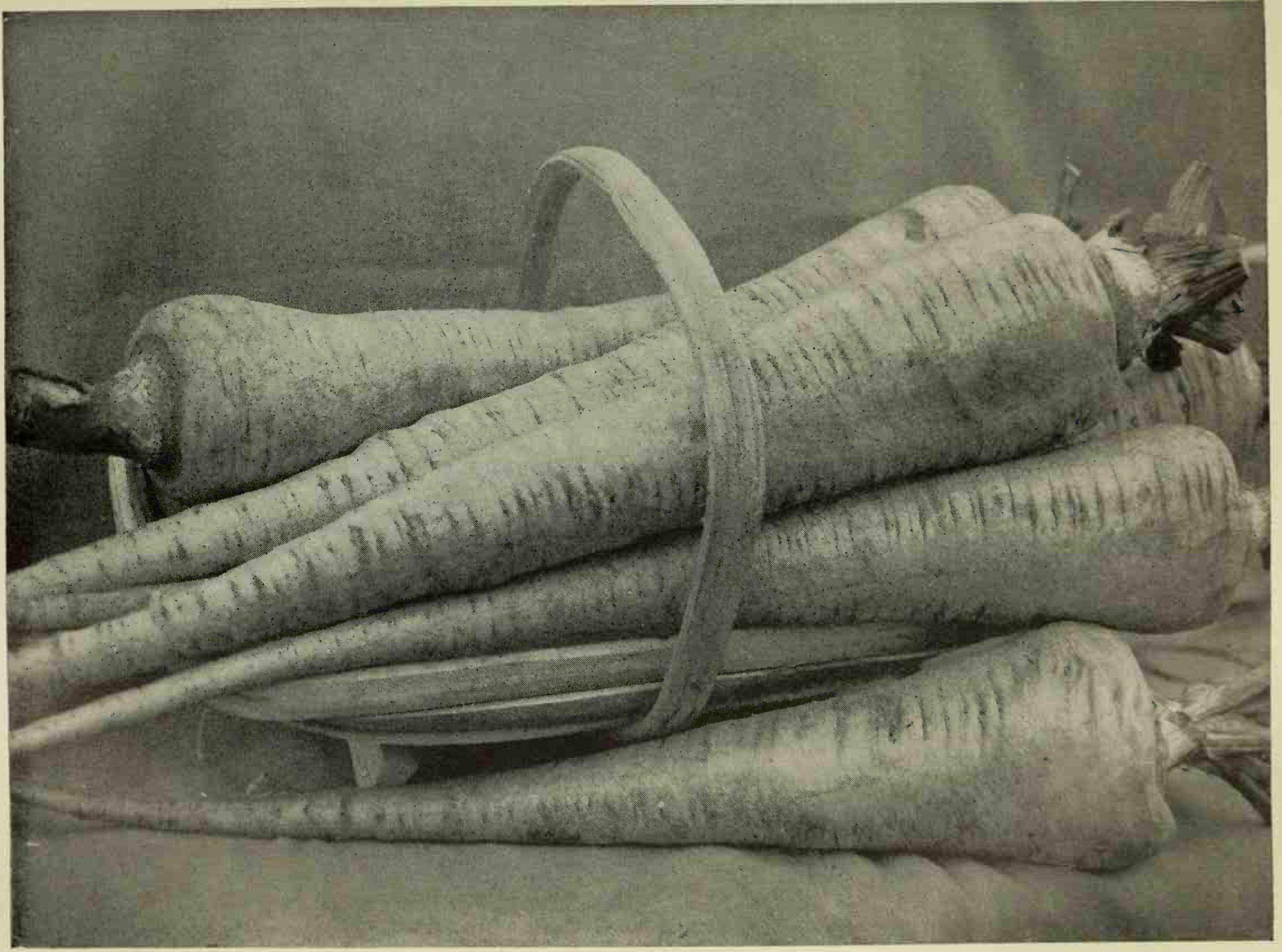
erecta: *H. hirsuta.*

hirsuta (*H. erecta*). To 12 in.: lvs. to 1 ft. and more long and ⅙ in. broad: fls. bright yellow, star-like, ½ in. long, in spring. Me. to Fla. and Tex.

HYSSOPUS. *Labiatæ.* One hardy per. subshrub from S. Eu. to Cent. Asia, grown for ornament in borders, somewhat for medicinal purposes and also as a sweet-herb. Hyssop is easily grown; propagated by seeds, cuttings and division. **H. officinalis.** Hyssop. To 1½ ft., sts. 4-angled: lvs. linear to oblong, to 2 in. long: fls. blue, ½ in. long, in terminal one-sided spikes to 5 in. long, stamens exserted. Var. **albus,** fls. white, **ruber,** fls. red. Var. **grandiflorus** has large fls.

HYSTRIX. *Gramineæ.* Tall per. grasses with flat lvs. and awned spikelets borne in terminal spikes; native in N. Amer., Eu. and Asia and one sometimes planted for ornament and useful for dry bouquets. See *Grasses.*

patula (*Asprella Hystrix*). Bottle-brush-Grass. To 4 ft.: lvs. to 9 in. long and ½ in. wide, rough above: spikes to 7 in. long, awns 1 in. or more long. N. B. to Ga. and Neb.



IX. PARSNIPS. — Shapely roots of the Student parsnip, grown in deep well-prepared ground

I

IBERIDELLA: *Æthionema trinervium.*

IBERIS. CANDYTUFT. *Cruciferæ.* Ann. and per. small usually glabrous herbs, sometimes woody and durable at base and evergreen, native in Medit. region, some of them well known as garden ornamentals: lvs. narrow, entire or dentate, in some species pinnatifid: fls. white, red, purple, in umbel-form clusters or in racemes that lengthen with age: fr. a broad more or less orbicular pod or silicle usually winged.

The candytufts of flower-gardens and borders are of two distinct classes,—the half-hardy annuals (grown every year from seeds), and the evergreen perennials. All of the garden candytufts thrive in any usual garden soil and require no special treatment. Usually the seeds of the annuals are sown where the plants are to grow, the plants thinned eventually to 6–12 inches apart. Bloom may be expected in two months or less. In mild countries, seeds are sometimes sown in autumn for winter and spring bloom. The colors are largely white, but run into flesh-colored, hyacinth and crimson. They are used for flower-beds, edgings, and for cutting. Keep the pods cut off, and do not allow the ground to become very dry as the plants tend to run rapidly to seed. Some of the kinds are fragrant.

The perennial candytufts are low compact plants, somewhat woody at base, with white flowers sometimes becoming lilac with age. Propagated by division, or by seeds sown a year before bloom is wanted.

affinis. Ann., erect, closely branching, to 16 in. high, setose-hairy to nearly glabrous: lvs. lobed along sides half way more or less to midrib, particularly toward apex: fls. white, frequently with lilac tinge, sometimes slightly fragrant, in umbel-like head that briefly elongates in fr. S. Eu.—Stock in cult. as *I. odorata, I. panduræformis, I. pectinata, I. pinnata* probably belong here rather than to botanical species of those names.

amara (*I. coronaria*). ROCKET C. Ann., erect, to 1 ft., sparsely pubescent: lvs. thickish, oblanceolate to spatulate, to 3 or 4 in. long, coarsely few-toothed: fls. large, white, fragrant, the raceme soon elongating. Fields, Eu.—A favorite flower-garden and florists candytuft, known in the Empress races, White Spiral, Hesperidiflora, Hyacinth-fld.; also very dwarf forms.

coronaria: *I. amara.*

corifolia. Per., evergreen, to 1 ft., glabrous: lvs. oblong to spatulate, 1½ in. or less long, entire: fls. white, in close clusters that elongate somewhat. Said to be a garden hybrid; sometimes mislabelled *cordifolia* and *cornifolia.*

gibraltarica. GIBRALTAR C. Per., evergreen, glabrous or nearly so, to 1 ft.: lvs. oblong-spatulate, 1–2 in. long, mostly entire: fls. lilac or light purple, in flattish clusters. Spain.—Useful for edgings.

Jordani. Bien. to 6 in.: lvs. oblong-spatulate, entire, white-hairy below: fls. rose, in umbels. Asia Minor.

Lagascana. Ann. to 1 ft., pubescent: lvs. oblong or nearly spatulate, toothed or notched at apex: fls. pure white, in close clusters. Spain.—Plants grown under this name are likely to be *I. amara.*

odorata: see *I. affinis.*

panduræformis: see *I. affinis.*

pectinata: see *I. affinis.*

pinnata: see *I. affinis.*

Pruiti. Per., evergreen, glabrous, to 6 or 8 in.: lvs. narrow-obovate to spatulate, sometimes obscurely toothed: fls. white. Sicily.

sempervirens. EDGING C. Per., evergreen, to 12 in., glabrous or nearly so: lvs. linear or narrow-oblong, to 1½ in. long, entire, blunt: fls. white, in elongating heads or racemes. S. Eu. to W. Asia.—Useful for edgings.

Tenoreana (*I. Pruiti* var. *hirtula*). Per., evergreen, to 6 or 8 in., simple, thinly pubescent: lvs. oblong to linear-spatulate, entire or toothed at summit: fls. whitish or rose, in a short umbel-like raceme. Spain to Italy.

umbellata. GLOBE C. Ann., glabrous or nearly so, to 16 in., branching: lvs. thin, lanceolate, acuminate, to 3½ in. long, entire or with 1 or 2 angles on margin: fls. pink, violet, purple, red, blush, not fragrant. S. Eu.—The common colored candytuft of flower-gardens, in such varietal names as Atropurpurea, Cardinal, Lavender, Lilacea, Rosea.

IBIDIUM: *Spiranthes.*

IBOZA. *Labiatæ.* African shrubs or herbs with very small diœcious fls., one grown under glass or out-of-doors in the S.

After blooming the plants should be cut back, and this will give good cuttings for the next winter's stock. Iboza is treated much like salvia and coleus.

riparia (*Moschosma riparium*). Per. to 5 ft., st. 4-angled: lvs. broad-ovate, to 2 in. long, coarsely toothed: fls. numerous, creamy-white with dark anthers, in erect panicles to 1 ft. long.

ICACINACEÆ. ICACINA FAMILY. Trees and shrubs, sometimes climbers, of about 40 genera of trop. distribution, allied to Sapindaceæ, of which Pennantia and Villaresia may be cult.: lvs. alternate, simple: fls. bisexual or polygamous, with 4–5 sepals, petals and stamens and 1-celled ovary: fr. a drupe.

ICACOREA: *Ardisia paniculata.*

ICE-PLANT: *Cryophytum crystallinum.*

IDESIA. *Flacourtiaceæ.* A monotypic genus, comprising a deciduous tree to 50 ft., native of Japan and China and hardy in the southern states. Propagated by seeds, root-cuttings and cuttings of green wood. **I. polycarpa.** Lvs. alternate, cordate-ovate, to 10 in. long, toothed, glaucous beneath: fls. mostly unisexual, greenish-yellow, fragrant, in drooping panicles to 10 in. long, without petals: berries orange-red, ⅓ in. across.

IDRIA. *Fouquieriaceæ.* One tree with soft often hollow trunks and lopping branches, native in Lower Calif. **I. columnaris** (*Fouquieria columnaris*). To 70 ft., with spines to 1½ in. long: lvs. oblanceolate, to ¾ in. long: fls. yellow, about ½ in. long, in large panicles at top of trunk: fr. a caps. to ¾ in. long. Sometimes planted in S. Calif.

ILAMA: *Annona diversifolia.*

ILEX. HOLLY. *Aquifoliaceæ.* Diœcious or polygamous trees or shrubs, sometimes evergreen, with alternate simple lvs.: fls. small, whitish, usually in axillary cymes, the petals somewhat united at base and sepals persistent: fr. a berry-like drupe with large hard seeds or nutlets: planted for good habit, attractive foliage and showy berries. Some species have medicinal value. The lvs. of one kind (*I. paraguariensis*) are used in S. Amer. for a tea or yerba de maté, and probably more than a single species is involved.

Hollies succeed in rich well-drained soil, although some species are native in swampy land. They may not bear transplanting well and some of the leaves are often stripped off first. Early fall or spring before growth starts are the best times for transplanting. Propagated by seeds which should be stratified as they do not germinate until the second year. The evergreen species may be propagated by cuttings under glass. Varieties may be grafted or budded.

altaclarensis. Hybrid between *I. Aquifolium* and *I. Perado.* Here belong the vars. **camelliæfolia** and **Lawsoniana**; also probably **Hodginsonii.**

ambigua: *I. caroliniana.*

Aquifolium. English H. Evergreen tree to 40 ft.: lvs. shining, ovate, with coarse spiny teeth: fls. in May–June on growth of previous year: berries scarlet. Eu., Asia. There are many hort. forms, the best known being: **albo-marginata** (var. *argenteo-marginata*), lvs. with narrow silvery margin; **aureo-regina** (var. *aureo-marginata*), the lvs. mottled with gray and having a yellow margin, **bacciflava** (var. *fructo-luteo*), fr. yellow; **balearica,** lvs. variously toothed; **ferox,** Hedgehog H., lvs. with strong teeth and numerous small spines and its form **aurea** with yellow spines and margins; **flavescens,** lvs. suffused with yellow; **handsworthensis,** lvs. 2 in. or less long, with numerous spines; **hastata,** lvs. halberd-shaped; **heterophylla,** lvs. entire or some of them with few teeth; **Hodginsonii,** lvs. roundish with distant spines; **laurifolia,** lvs. usually entire; **microphylla,** lvs. small with small spines; **myrtifolia,** lvs. 1½ in. or less long; **pendula** with pendulous branches: **princeps,** large broad lvs. with strong spines; **pyramidalis** with ascending branches; **recurva** (var. *tortuosa*), lvs. spirally twisted; **serratifolia,** lvs. with numerous small spiny teeth.

caroliniana (*I. ambigua*). Deciduous shrub or a tree to 20 ft.: lvs. oval to obovate or elliptic, to 3 in. long, serrate toward apex, glabrous: fls. solitary or several in axils: berries about ¼ in. diam., red. N. C. to Tex.

Cassine (*I. Dahoon*). Dahoon. Evergreen shrub or tree to 25 ft.: lvs. obovate, entire or shallow-toothed: fls. in May, on wood of season: berries dull red, rarely yellow. Va. to Fla. and La.

corallina. Evergreen to 25 ft.: lvs. lanceolate, spiny- or wavy-toothed, shining above: berries red. China.

cornuta. Evergreen shrub to 10 ft.: lvs. shining, quadrangular-oblong, 3-pointed at apex, with strong spines: fls. June–July on branches of previous year: berries scarlet. N. China.

crenata (*I. Fortunei*). Japanese H. Evergreen shrub to 20 ft.: lvs. oval to oblong, wavy-toothed: fls. May–June, on the season's growth: berries black. Japan. Var. **latifolia** has elliptic lvs. Var. **microphylla** has lvs. ½ in. or less long.

Dahoon: *I. Cassine.*

decidua. Possum-Haw. Deciduous shrub or tree to 30 ft.: lvs. obovate, wavy-toothed: fls. in May: berries red or orange. Swamps, Va. to Fla. and Tex.

dipyrena. Evergreen tree to 40 ft.: lvs. ovate to oblong, remotely spiny-toothed: fls. Apr.–May, on branches of previous year: berries red. Himalayas.

dubia (*I. mollis*). Tree to 30 ft. and more or a shrub: lvs. ovate to oblong-lanceolate, to 4 or 5 in. long, serrate, soft-pubescent underneath: fr. cherry-red, about ⅓ in. across, on very short stalks. Mass. to Ga. Var. **monticola** (*I. monticola*), of similar range, has lvs. nearly or quite glabrous underneath.

Fargesii. Tree or shrub to 20 ft.: lvs. oblong- to linear-lanceolate, finely toothed above middle: fls. May–June: fr. red. China.

Fortunei: *I. crenata.*

glabra. Inkberry. Winterberry. Evergreen shrub to 8 ft.: lvs. obovate, entire or with a few teeth at apex: fls. June–July, on season's growth: berries black. Mass. to Fla. and Miss.

Hodginsonii: see *I. Aquifolium* and *altaclarensis.*

integra. Evergreen shrub or tree to 40 ft.: lvs. oval to oblong, entire or rarely with few teeth: fls. in spring, on branches of previous year: berries red. Japan.

intricata. Low straggling evergreen shrub: lvs. obovate, coarsely toothed: fr. red. Himalayas.

lævigata. Smooth Winterberry. Deciduous shrub to 6 ft.: lvs. oval to oblong, finely toothed, turning yellow in autumn: fls. May–June: berries orange-red. Swamps, Me. to Ga.

latifolia. Tarajo. Evergreen tree to 60 ft.: lvs. oblong, shallowly toothed, shining, to 7 in. long: berries red. Japan.

macrocarpa. Tree to 30 ft.: lvs. elliptic or lanceolate-oblong, finely toothed: fr. black. China.

maderensis: *I. Perado.*

mollis: *I. dubia.*

monticola: *I. dubia* var.

myrtifolia. Evergreen shrub or small tree: lvs. oblong to linear, entire: fls. in spring, on season's growth: berries red, rarely yellow. Swamps, N. C. to Fla. and La.

opaca. American H. Evergreen tree to 50 ft.: lvs. elliptic to obovate, with large spiny teeth, rarely entire: fls. in June, on season's growth: berries dull red or rarely yellow. Mass. to Fla. and Tex.

paraguariensis. Evergreen shrub or small tree to 20 ft.: lvs. obovate or oblong, wavy-toothed: berries red or reddish-brown. Brazil.

pedunculosa. Evergreen shrub or tree to 30 ft.: lvs. ovate, entire: berries bright red, on long stalks. Japan.

Perado (*I. maderensis*). Evergreen shrub or tree to 20 ft.: lvs. ovate to oblong-lanceolate, spiny-toothed: berries dark red or nearly black. Canary Isls., Azores.

Pernyi. Evergreen shrub or tree to 30 ft.: lvs. rhombic-ovate, about 1 in. long, with 1–3 spines on each side, shining: fls. in May: fr. red. China.

serrata (*I. Sieboldi*). Deciduous shrub to 15 ft.: lvs. ovate, finely toothed: fls. in June: berries bright red. Japan. Var. **xanthocarpa** has yellow frs.

Sieboldi: *I. serrata.*

Topeli. Stated to be a hybrid between American and Yaupon hollies (*I. opaca* and *I. vomitoria*): narrow-lvd. evergreen with small red berries.

verticillata. Black-Alder. Winterberry. Deciduous shrub to 10 ft.: lvs. oval to lanceolate, toothed: fls. June–July: berries bright red. Conn. to Fla. and Mo.

vomitoria. Yaupon. Cassena. Evergreen shrub or small tree to 25 ft.: lvs. oval to oblong, wavy-toothed: fls. in May, on branches of previous year: berries scarlet. Va. to Fla. and Tex.

ILLICIUM. *Magnoliaceæ.* Aromatic evergreen trees and shrubs native in S. U. S. and the Orient, having simple, entire, short-stalked lvs. and small axillary fls. solitary or in 3's; grown for ornament in warm countries. Propagated by seeds and cuttings of half-ripened wood.

anisatum (*I. religiosum*). Small tree or shrub: lvs. elliptic, to 3 in. long: fls. greenish-yellow, about 1 in. across, with spreading petals, borne on bracted peduncles. Japan.—Yields a poison. Var. **variegatum** has variegated foliage.

floridanum. Shrub to 10 ft.: lvs. elliptic, to 6 in. long: fls. purple, to 2 in. across, nodding; petals very narrow, 20–30. Fla. to La.

religiosum: *I. anisatum.*

verum. Star Anise. Small tree or bush: fls. globose, on short nearly or quite bractless peduncles, the petals not spreading. China.—Some of the stock grown in this country as *I. anisatum* may belong here.

IMANTOPHYLLUM: *Clivia.*

IMMORTELLE: *Xeranthemum annuum;* see *Everlastings;* also *Erythrina.*

IMPATIENS. Touch-Me-Not. Snapweed. *Balsaminaceæ.* Succulent ann. and per. herbs with simple lvs., very irregular spurred fls. solitary or clustered in the axils, and capsular fr. which bursts elastically into spirally coiled valves, expelling the seeds; grown in the flower-garden or under glass for the odd and showy bloom.

The garden balsam, *I. Balsamina*, requires a fertile sandy soil and should be spaced about 2 feet apart for best development. It makes a stout central stem and many side branches. It may be grown to a single stem by pinching off the side shoots and thereby expose the bloom. Seeds should be sown in boxes or pots in April and transplanted. The greenhouse species may be increased by seeds or cuttings and can be grown in the open if treated like tender annuals.

Balfourii. Per. to 3 ft.: lvs. ovate-lanceolate: fls. light rose on standard, red on keel, yellow at base of wings and rose at apex, on long stalks in racemes at top of st. W. Himalayas.—A good flower-garden subject if seeds are started early.

Balsamina. GARDEN BALSAM. Ann. to 2½ ft.: lvs. lanceolate: fls. of various colors, white to red or yellow, spotted, the cult. forms mostly double, borne close to the st. and overtopped by leafy shoots. Trop. and subtrop. India, Malaya, China.—An old flower-garden favorite; tender.

glanduligera: *I. Roylei.*

Holstii. Per. to 3 ft.: main lvs. ovate and little if at all tapering at base, 3–4 in. long and three-fourths as broad: fls. scarlet, to 1¾ in. across, on long stalks and borne toward top of st., with slender downward spur about 1½ in. long. E. trop. Afr.—Modified under cult.

Oliveri. Per. to 8 ft.: lvs. oblanceolate to oblong, with setose serratures: fls. lilac or rose, on long stalks toward top of st., with long slender spur. E. trop. Afr.

Petersiana. Differs from *I. Holstii* in the general red or bronzy color, the elliptic lvs. and carmine-red fls. W. trop. Afr.

platypetala. Per.: lvs. lanceolate to oval: fls. rose-colored, on long stalks toward top of st., with long curved spur. Java.

Roylei (*I. glanduligera*). Ann. to 4 or 5 ft., very erect: lvs. ovate to ovate-lanceolate: fls. dark purple, on long stalks toward top of st., with very short spur. Mts. of India.

scabrida. Ann. to 5 ft.: lvs. ovate to lanceolate: fls. golden-yellow spotted with red, on long stalk toward top of st., spurred. Himalayas.

Sultani. Per. to 2 ft.: main lvs. ovate-lanceolate, long-tapering at base and apex, 2–3 in. long and half or less as broad: fls. scarlet (varying to white and pink), to 1½ in. across, on long stalks toward top of st., with slender up-curved spur, sometimes twice as long as petals. Zanzibar.—Plants grown under this name may be *I. Holstii.*

IMPERATORIA: *Peucedanum Ostruthium.*

INCARVILLEA. *Bignoniaceæ.* Asian herbs with alternate simple or pinnate lvs., funnelform red or yellow fls. in terminal clusters, and narrow capsular frs.; good border plants, doing best in sunny positions in light sandy loam. Propagated by seed or division. Some of them hardy well N.

compacta. Per. to 1 ft. or more: lfts. nearly entire: fls. purple, 1½ in. across and 2½ in. long. China.

Delavayi. To 2 ft.: lvs. pinnate into 15–20 toothed lfts. to 5 in. long: fls. rose-purple with yellow tube, to 3 in. long and wide. China.

grandiflora. Similar to *I. Delavayi* but shorter, with lfts. nearly entire, and fewer rose-red fls. China. Var. **brevipes** has brilliant crimson fls.

lutea. To 4 ft.: lfts. wavy-toothed: fls. yellow, 2 in. across. China.

Olgæ. To 3 ft., shrubby: lfts. entire or toothed toward apex: fls. pale pink, 1½ in. long and 1 in. across. Cent. Asia.

variabilis. Shrubby, to 2 ft. or more: lvs. 2–3-pinnate into cut segms.: fls. pink, 1 in. across. China.

INCISED: cut; slashed irregularly, more or less deeply and sharply.

INCLUDED: not protruded, as stamens not projecting from the corolla; not exserted.

INDEHISCENT: not regularly opening, said of a seed-pod or anther.

INDIAN CUP: *Silphium perfoliatum.* **Pipe:** *Monotropa uniflora.* Shot: *Canna indica.*

INDIGEN: an indigenous plant or species; native and normal to the country or region; to be employed in contrast to cultigen, which see.

INDIGO: *Indigofera.* **Bastard:** *Amorpha fruticosa.* **False:** *Amorpha, Baptisia.* **Wild:** *Baptisia.*

INDIGOFERA. INDIGO. *Leguminosæ.* Per. herbs and shrubs with pinnate lvs. or sometimes reduced to 1 lft., papilionaceous fls. in axillary racemes, and cylindrical pods; grown for ornament in borders and shrubberies, and some species formerly for indigo and now run wild. Most of the species are not hardy in the northern states. Propagated by seeds and cuttings.

amblyantha. Shrub to 6 ft.: lfts. 7–11, to 1½ in. long: fls. pink, ¼ in. long, in racemes shorter than the lvs. China; hardy N.

Anil: *I. suffruticosa.*

australis. Shrub to 4 ft.: lfts. 9–17, to ¾ in. long: fls. red, about ¼ in. long, in racemes about length of lvs. Australia.

decora. Shrub to 2 ft.: lfts. 7–13, to 2½ in. long: fls. pink with white standard, to ¾ in. long, in racemes longer than lvs. China.

Dosua. Low shrub: lfts, 21–31, to ½ in. long: fls. red, to ½ in. long, in racemes about length of lvs. India. Var. **tomentosa** is more pubescent, with longer lvs. and racemes.—Most of the material cult. under this name is *I. Gerardiana.*

floribunda: *I. Gerardiana.*

Gerardiana (*I. floribunda*). Shrub to 6 ft., much branched: lfts. 13–21, to ½ in. long: fls. rosy-purple, ½ in. long, in racemes about length of lvs. India.

Kirilowii. Shrub to 4 ft.: lfts. 7–11, to 1½ in. long: fls. bright rose, ¾ in. long, in racemes longer than lvs. N. China, Korea; hardy N.

leptosepala. Per., the decumbent sts. to 2 ft. long: lfts. 5–9, to 1 in. long: fls. pink or purplish, ¼ in. long, in racemes longer than lvs. Ga. to Mex.

Potaninii. Shrub to 5 ft.: lfts. 5–9, to 1¼ in. long: fls. lilac-pink, ⅓ in. long, in racemes longer than the lvs. China.

suffruticosa (*I. Anil*). Shrub to 6 ft.: lfts: 11–13, to 1½ in. long: fls. orange, ⅙ in. long, in racemes shorter than lvs. W. Indies; nat. in S. U. S.

tinctoria. Shrub to 2 ft.: lfts. 9–17, to ¾ in. long: fls. reddish-yellow, ¼ in. long, in racemes shorter than lvs. Tropics.

INFERIOR: beneath, lower, below; as an inferior ovary, one that is below the calyx-leaves.

INFLATED: blown up; bladdery.

INFLORESCENCE: mode of flower-bearing; technically less correct but much more common in the sense of a flower-cluster.

INGA. *Leguminosæ.* Trees or shrubs with pinnate lvs. of large lfts., the petiole often winged, large fls. in racemes, spikes or heads, not papilionaceous, the stamens long-exserted, often 4-angled pods thickened on the margins; native in trop. Amer. where some of the species are planted for shade in coffee plantations and as windbreaks; the fleshy pulp around the seeds is also an article of food. Some of them stand in S. Calif. and S. Fla.

dulcis: *Pithecellobium dulce.*

Feuillei. To 30 ft.: lvs, of 6–8 lfts,, the petioles winged: fls. white: pods flat, to 2 ft. long. Peru.

laurina. GUAMA. To 50 ft.: lvs. of 4–6 lfts.: fls. white, fragrant, in long racemes: pods flat, 6 in. long. Trop. Amer.

pulcherrima: *Calliandra Tweedii.*

Saman: *Samanea Saman.*

vera. GUABA. To 50 ft.: lvs. of 8–12 lfts., the petioles winged: fls. white, in short spikes: pods 4-ribbed, to 6 in. long. Trop. Amer.

INGENHOUZIA. *Malvaceæ.* A few Mexican shrubs or subshrubs, one sometimes planted in warm regions. **I triloba.** To 10 ft.: lvs. alternate, parted nearly to the base into 3–5 narrow lobes, or the upper lvs. may be mitten-shaped or entire: fls. white turning to pink, about 1 in. long: fr. a caps. about ½ in. long.

INKBERRY: *Ilex glabra.*

INODES: *Sabal.*

INSECTS AND INSECTICIDES. Cultivated plants are subject to attack by an immense variety of insects belonging to several different orders. Among the most important of these are the larvæ or caterpillars of moths and butterflies. These devour the leaves, bore in the stems and trunks of trees, mine the leaves, destroy the buds, and infest the fruit. Beetles are also important enemies of plants; both the adults and their larvæ, or grubs, attack all parts of the plant including the roots, stems, leaves, flowers, fruit, and even the seeds. Among the true bugs of entomologists are many important pests, some of which are most difficult to control. Here belong the scale insects, whiteflies, the plant-lice or aphids, leaf-hoppers, the pear psylla, squash-bug, and many others. Among the hymenoptera or wasp-like insects the most important injurious forms are the sawfly larvæ such as the pear and cherry slugs, the rose slugs and the currant-worms. To another group belong the thrips—small, dark colored, elongate insects that attack the flowers and opening buds of pear and injure the leaves of onions and other garden crops.

With the exception of certain generations of plant-lice and some scale insects, nearly all insects pass through an egg stage in the course of their development. In the round of their life cycle there are two general types of development. In one, the insect on hatching from the egg resembles in general the adult but lacks wings and is known as a nymph. To this group belong the true bugs and grasshoppers. In the other type of development the young insect bears very little resemblance to the adult and is known as a larva. The larvæ of moths and butterflies are usually known as caterpillars, of beetles as grubs, of flies as maggots. In this case the larva does not transform directly into the adult but passes through a resting stage known as the pupa. The more one learns about the life history of the pests attacking one's crops, the better one is fitted to fight them intelligently. See *Fungi and Fungicides.*

For purposes of control insects may be divided into two classes: 1. *Chewing insects.* In this class the insects actually bite out and swallow pieces of plant tissue. If poison has been applied to the plant they are likely to eat some of it with fatal results. Examples of this class are the beetles and their larvæ, caterpillars, grasshoppers, and sawfly larvæ such as the currant-worms and rose slugs. The insecticides employed for the control of chewing insects are internal poisons, the most common of which are various forms of arsenic. 2. *Sucking insects.* These puncture the plant tissue with their needle-like mouth-parts and then suck out the juices. Here belong the scale insects, plant-lice, and all the true bugs. The insecticides employed against sucking insects are contact poisons such as nicotine, oils and soaps.

Internal poisons

Arsenicals.—The most widely used insecticides for chewing insects are arsenical compounds. While considerable numbers of these compounds have been tested experimentally and used to a small extent, only two are now of wide usefulness. These are lead arsenate and calcium arsenate.

Lead arsenate.—Formerly lead arsenate was manufactured in the form of a paste but this has now been almost entirely superseded by a dry powdered preparation. Lead arsenate is widely used on orchard and bush-fruits and is usually applied at the rate of 2½ pounds in 100 gallons of the proper fungicide. It combines well with lime-sulfur or bordeaux mixture but cannot be used with sodium-sulfur fungicides.

Calcium arsenate is widely used on potatoes, cucumbers and other vegetable crops where a quick-acting poison is needed and where there is little danger of foliage injury. It is not only an effective poison when used in combination with bordeaux mixture but it also adds to the value of the bordeaux and for this reason small amounts are often added even when there is no need of applying an insecticide. For use on potatoes for the Colorado potato-beetle, 3 pounds to 100 gallons of bordeaux mixture is the standard recommendation. On cucumbers 2 pounds are used. It is often applied dry as a dust in combination with gypsum or lime or with the fungicide known as copper-lime dust. It is rarely used on fruit-trees because of the danger of foliage injury.

Contact insecticides

Lime-sulfur solution is widely used against scale insects and as a fungicide. It is usually sold on the market in the form of a concentrated solution testing about 32° Baumé. It can be prepared easily at home but the saving is not sufficient to warrant the trouble except when large quantities are used. A dry lime-sulfur or more properly a desiccated lime-sulfur solution is also on the market. Due to the fact that much of the material does not go back into solution when placed in water, this material is not as effective as the concentrated solution. Against scale insects liquid lime-sulfur is commonly used at the rate of 1 part in 8 parts of water.

Nicotine.—Of contact insecticides for plant-lice and other soft-bodied insects nicotine is the most effective and most widely employed. For out-of-doors nicotine sulfate is used almost exclusively. It is sold in the form of a rather thick black liquid containing 40 per cent by weight of nicotine as nicotine sulfate. In this form it is not volatile. For use it is diluted at the rate of ¾ to 1 pint in 100 gallons of water or the proper fungicide. It combines well with lime-sulfur or with bordeaux mixture. If used alone in water it is not effective unless 4 or 5 pounds of soap are added to each 100 gallons of the mixture. An effective dust can be prepared by thoroughly mixing nicotine sulfate with hydrated lime to make a 2 or 3 per cent mixture. Mixtures of this kind are on the market but as they deteriorate in time only fresh preparations should be employed. For a spray in the greenhouse nicotine is usually sold in the form of a 40 per cent solution, the nicotine being in the "free" or uncombined state. Nicotine is also used for fumigating by burning paper impregnated with the poison or by volatilizing the solution over heat. Finely ground tobacco dust is also a valuable insecticide. It can be applied either as a dust or in water as a spray.

Oils.—Oil sprays have a wide field of usefulness against scale insects, red-mites and the eggs of certain insects such as the pear psylla and the fruit-tree leaf-roller. Several kinds of oil preparations are available. Miscible oils are sold under a number of trade names and should be diluted for use according to the recommendations of the manufacturers. Lubricating oil emulsions have in recent years come into favor because of their effectiveness and safety when properly used. These emulsions can be purchased in the form of a stable stock emulsion to be diluted or they can be prepared by mixing the ingredients in the spray tank for immediate use. A lubricating oil emulsion in bordeaux mixture is now the standard treatment for the onion maggot.

Soaps.—Solutions made from good grades of laundry or fish-oil soaps are convenient contact insecticides for use in the home-garden but are much more effective if combined with nicotine.

INSERTED: attached; as of a stamen growing on the corolla.

INTERRUPTED: not continuous; in particular, the interposition of small leaflets or segments between large ones.

INULA. *Compositæ.* Herbaceous perennials, mostly hairy, with alternate or basal lvs. and solitary or few daisy-like heads, yellow seldom white; pappus of bristles; native in Eu., Asia and Afr.

Inulas grow well in the average garden soil but require a sunny situation. Propagated by division and by seeds. Useful in the border, and mostly hardy North.

acaulis. Stemless: lvs. all basal, oblong-spatulate, entire, to 1½ in. long: heads solitary, yellow. Asia Minor.

bifrons. Bien., sticky-glandular: lvs. oval-oblong, glabrous. S. Eu.

britannica. To 1½ ft., hairy: lvs. lanceolate, slightly toothed: heads lemon-yellow, to 1½ in. across, June-Aug. Eu., Asia.

bubonium: *I. ensifolia.*

dysenterica: *Pulicaria dysenterica.*

ensifolia (*I. bubonium*). To 2 ft., nearly glabrous: lvs. linear-lanceolate: heads yellow, 1½ in. across, July-Aug. Eu., N. Asia.

glandulosa. CAUCASIAN I. To 4 ft., hairy: lvs. oblong-spatulate to oblong, entire: heads solitary, yellow. Caucasus. Var. **laciniata** has fringed half-drooping golden-yellow rays.

grandiflora. To 4 ft., hairy: lvs. elliptic-oblong, toothed, to 4 in. long: heads solitary, orange-yellow, to 5 in. across. Himalayas, Caucasus.

Helenium. ELECAMPANE. To 6 ft.: lvs. oblong, to 2 ft. long, toothed, velvety beneath, rough above: heads yellow, to 4 in. across. Eu., N. Asia; widely nat. in E. N. Amer.

hirta. To 15 in.: lvs. lanceolate or ovate-oblong, nearly entire, reticulated: heads yellow, to 2 in. across, July-Aug. Eu., W. Asia.

limonifolia. To 1 ft., shrubby, gray-pubescent: lvs. ovate or oblong-spatulate, entire: heads yellow. Greece.

macrocephala: *I. Royleana.*

montana. To 1½ ft.: lvs. lanceolate, entire, hairy: heads solitary, 1½ in. across, with many narrow yellow rays. S. Eu.

Oculus-Christi. To 2 ft., silky-hairy: lvs. oblong, entire: heads yellow, about 1 in. across. Eu.

odora: *Pulicaria odora.*

Royleana (*I. macrocephala*). To 2 ft.: lvs. ovate, to 10 in. long, toothed, tomentose beneath: heads orange-yellow, to 4 in. across, buds conspicuous, black. Himalayas.

salicina. To 2 ft., nearly glabrous: lvs. lanceolate, usually entire: heads golden-yellow, 1½ in. across. Eu., Asia.

INVERTED: turned over; end-for-end; top-side down.

INVOLUCEL: a secondary involucre; small involucre about the parts of a cluster, prominent in some of the Umbelliferæ.

INVOLUCRE: a whorl or aggregation of small leaves or bracts standing close underneath a flower or flower-cluster.

IOCHROMA. *Solanaceæ.* Shrubs and small trees sometimes grown under glass and in the open in warm or subtrop. parts, with entire often large lvs. and showy tubular or bell-shaped fls. in pairs or sometimes clusters, purple, blue, scarlet, yellow or white. Propagated by cuttings in Feb. or early Mar., and by seed when obtainable.

carneum: hort. name.

coccineum. Shrub, the branches pubescent: lvs. oblong, wavy, long-acuminate: fls. scarlet, 2 in. long, in drooping clusters. Cent. Amer.

fuchsioides. Shrub, nearly glabrous: lvs. obovate to oblong, very obtuse: fls. more or less clustered, drooping, orange-scarlet, 1½ in. long. Peru.

hybridum: hort. name.

lanceolatum. Shrub to 8 ft., pubescent: lvs. ovate or oval-lanceolate, acute: fls. rich deep purple-blue, to 2 in. long, in umbels. Ecuador.

purpureum: hort. name.

tubulosum. Shrub to 8 ft., pubescent: lvs. ovate, acute or acuminate: fls. deep blue, 1½ in. long, in drooping clusters. Colombia.

IONACTIS: *Aster linariifolius.*

IONIDIUM. *Violaceæ.* Widely distributed herbs or rarely shrubs with simple lvs. and irregular fls. saccate or gibbous at base, solitary or in racemes in axils.

linearifolium (*Viola linearifolia*). To 1½ ft.: lvs. oblong-linear or obovate, to 2 in. long and ⅓ in. wide: fls. bluish or bluish-white, ¼ in. long. W. Indies.

IONOPSIDIUM. Diamond-Flower. *Cruciferæ.* One little flower-garden ann., I. acaule, from Portugal, adaptable also to pots in the cool greenhouse. It is a running miniature, the violet or sometimes white dainty little fls. rising 3 or 4 in. above the ground on very slender stalks: lvs. very long-petioled, the blade nearly orbicular, to ½ in. across.—Seeds may be sown in early spring for bloom before midsummer; or in summer for autumn bloom; or in autumn for spring bloom, the transplants being carried over in pots under glass. See that the plant is well protected from drying winds and burning sun.

IONOXALIS: *Oxalis.*

IPECAC, AMERICAN: *Gillenia stipulata.*

IPOMŒA. Morning-Glory (see also *Argyreia*). *Convolvulaceæ.* Widely distributed plants of various habit but mostly known to hort. as twining ann. and per. herbs: lvs. alternate, simple or compound: fls. funnelform, with 5-angled limb. Differs from Convolvulus in having a capitate instead of 2 linear stigmas, and from Calonyction and Quamoclit in the stamens and style not prominently exserted and other characters.

Morning-glories are of easy cultivation in any good soil. In the North the tubers of the perennial kinds should be dug up and kept indoors over winter. They are useful for covering fences, trellises and banks and may also be grown in pots. Propagated by seeds which germinate more readily if small notches are filed in them. The perennial species are increased by cuttings under glass, and rarely by division or grafting on common stocks.

Batatas. Sweet-Potato (which see). Per. with trailing rooting sts. and tuberous edible roots: lvs. varying from ovate and entire to digitately lobed, to 6 in. long: fls. rose-violet or pale pink, 2 in. long, infrequently produced in U. S. Tropics; cultigen.

Bona-Nox: *Calonyction aculeatum.*

cairica. Per., twining: lvs. palmately divided into 5 oval lfts. to 2 in. long; fls. pale pink, to 2½ in. long. Tropics.

coccinea: *Quamoclit coccinea.*

digitata: *I. paniculata.*

dissecta. Per., twining, sts. hairy: lvs. to 4 in. long, digitately 5–7-parted into toothed or lobed segms.: fls. white with purple throat, to 2 in. across, the calyx much enlarged in fr. Tropics, Ga. to Fla. and Tex.

grandiflora: *Calonyction aculeatum.*

hederacea. Ann., twining, hairy: lvs. cordate-ovate, to 3½ in. long, usually 3-lobed to the middle: fls. blue or pale purple, to 2 in. long. Trop. Amer.—Differs from related species in the sepals contracted into linear recurved or spreading tips.

hederifolia: *Quamoclit coccinea* var.

hirsutula. Ann., twining or trailing, pubescent: lvs. cordate-ovate, to 3 in. long, becoming deeply 3-lobed: fls. bright bluish-purple to white, to 2½ in. long. Trop. Amer.

Horsfalliæ. Per., twining: lvs. palmately divided into 5–7 obovate entire thick lfts. to 4 in. long: fls. rose or pale purple, to 2½ in. long, the limb becoming revolute. Tropics. Var. **Briggsii** has many magenta-crimson fls.

imperialis: *I. Nil.*

Leari. Blue Dawn-Flower. Per., twining: lvs. cordate-ovate, to 8 in. long, entire or sometimes 3-lobed, finely pubescent beneath: fls. blue turning pink, the tube white, to 5 in. across. Trop. Amer.

leptophylla. Bush M. Per., with large tuberous roots and erect or ascending sts. to 4 ft.: lvs. linear, to 5 in. long, entire: fls. purple or pink, 3 in. across. S. D. to New Mex.

limbata: *I. Nil* var.

mexicana grandiflora: *Calonyction aculeatum.*

montana: *Jacquemontia montana.*

mutabilis. Per., twining: lvs. broad-cordate-ovate, to 6 in. long, entire or sometimes 3-lobed, gray-pubescent beneath: fls. blue or purplish, the tube white, to 3½ in. long. Trop. Amer.

Nil. Per., twining or trailing, hairy: lvs. broad-cordate-ovate, to 6 in. across, usually shallowly 3-lobed: fls. blue, purple or rose, 2 in. across, often double. Tropics. Var. **limbata** (*I. limbata*), fls. violet-purple margined with white.—Here belong the Imperial Japanese morning-glories, *I. imperialis* of hort.

noctiflora: *Calonyction aculeatum.*

pandurata. Wild Sweet-Potato Vine. Per., with large tuberous root, trailing or twining: lvs. broad-cordate-ovate, to 6 in. long, entire or fiddle-shaped: fls. white with purple throat, to 4 in. across. Conn. to Fla. and Tex.

paniculata (*I. digitata*). Per., twining or trailing: lvs. to 7 in. across, digitately parted nearly to base into 5–7 narrow entire lobes: fls. lilac or pink, to 3 in. across. Tropics.

pterodes. Per., twining, with large tuberous root: lvs. cordate, to 3 in. long: fls. yellow, 2 in. long and across. Panama to Guiana.

purpurea. Common M. Ann., twining, sts. hairy: lvs. broad-cordate-ovate, to 5 in. long, entire: fls. purple, blue or pink with pale tube, to 3 in. long, sometimes double. Trop. Amer., and more or less nat. Var. **alba** has white fls.

Quamoclit: *Quamoclit pennata.*

rubro-cærulea: *I. tricolor.*

setosa. Brazilian M. Per., twining, sts. with stiff purplish hairs: lvs. cordate-ovate, to 10 in. across, 3-lobed and grape-like: fls. rose-purple, to 3 in. long. Brazil.

tiliacea. Per., twining: lvs. cordate-ovate, to 3 in. long: fls. purple or pink with darker throat, rarely white, to 2½ in. long. Trop. Amer.

tricolor (*I. rubro-cærulea*). Per. but grown as ann., twining: lvs. cordate-ovate, to 5 in. long, entire: fls. purplish-blue, the tube white and limb red before opening, to 4 in. across. Trop. Amer.

Tuba: *Calonyction Tuba.*

IPOMŒA, STAR: *Quamoclit coccinea.*

IPOMOPSIS: *Gilia rubra.*

IRESINE. Blood-Leaf. *Amaranthaceæ.* Climbing or erect herbs and subshrubs with ornamental foliage, the fls. small and borne in panicles; native in many trop. and temp. regions, a few cult. as house and bedding plants.

Propagated by cuttings taken in late summer for house plants and in February or March for summer bedding purposes in the North; the stock plants for these are easily wintered over. They are handled in the same way as coleus. They are commonly grown only as seasonal plants for foliage and not allowed to go into the flowering stage.

acuminata: *I. Lindeni.*

Emersonii: *I. Lindeni.*

formosa: *I. Lindeni.*

Herbstii (*Achyranthes Herbstii. A. Verschaffelti*). To 6 ft.: lvs. broad-ovate, to 5 in. long, notched at tip, purplish-red or green with yellowish veins. S. Amer. Var. **aureo-reticulata** has green or greenish-red lvs. with yellow veins. —**I. Wallisii** of the trade probably belongs here.

Lindeni (*I. acuminata. Achyranthes acuminata*). Lvs. usually deep blood-red, narrow and sharp-pointed. Ecuador.—Here evidently belong **I. Emersonii** (*Achyranthes Emersonii*) and **I. formosa.**

Wallisii: *I. Herbstii.*

IRIDACEÆ. Iris Family. Irids. About 60 widely distributed herbaceous monocotyledenous genera having corms, bulbs or rootstocks, mostly narrow basal lvs., bisexual fls. subtended by bracts or spathes, the perianth of 6 segms. in 2 series, 3 stamens, inferior usually 3-celled ovary, and capsular fr. The family yields many ornamental subjects, some medicinal products, and other genera have minor economic uses. Some of them are hardy perennials for the open garden, others are summer "bulbs," and a few are known mostly with us as glasshouse subjects. There are no special difficulties in the cult. of the irids except, perhaps, that some of the bulbous and stoloniferous species of iris may require careful attention to conditions. Genera known to cult. in N. Amer. are: Acidanthera, Antholyza, Aristea, Babiana, Belamcanda, Cipura, Crocosmia, Crocus, Cypella, Dierama, Freesia, Gladiolus, Iris, Ixia, Lapeirousia, Libertia, Marica, Melasphærula, Morea, Nemastylis, Schizostylis, Sisyrinchium, Sparaxis, Tigridia, Trimeza, Tritonia, Watsonia.

IRIS. *Iridaceæ.* Herbaceous perennial plants widely spread in the northern hemisphere, of 170 species or more, many of them highly prized for the showy and characteristic bloom. The fls. vary greatly in conformation and color. The general structure is a perianth of 6 parts united below into an evident or a very short tube; the 3 outer parts or segms. are mostly long and hanging or horizontal and are known as the "falls," the narrowed lower or stem-like part being the "haft"; the 3 inner segms., known as "standards," are commonly erect or inwardly or outwardly arched, often small, being narrowed below into a "haft" or "claw." There are 3 flat and more or less petal-like colored style-branches, covering the 3 stamens beneath, the stigmatic part being underneath and at some distance from the notched or crested tip of the branch. The ovary is inferior, and it matures into a 3-celled more or less angled many-seeded mostly dry pod or caps. The fls. are borne singly or few together in the axils of green bracts or spathes, at the top of the st. or culm and sometimes from the axils. The infl. from each spathe is known technically as a "head," whether the fls. are one or several; when the fls. are more than one in a spathe or head, they follow each other successively.

The irises yield a wide range of color, from the lilacs and purples to whites and yellows. The color arrangement is difficult to describe because of the complicated markings and the shading of one tint into another. In the lilac series of colors the tints are numerous from blue to purple and it is practically impossible to express them in words; and different persons will describe the same plant in different color terms.

Irises are spring- and summer-flowering plants, the common kinds following the late tulips. They are excellent for borders and also in special beds by themselves; if shaded by bushes or other tall plants they may not make proper late root development for the next year's bloom.

The "blue flags" of old gardens are irises, mostly of the bearded type. The horticultural kinds have been greatly improved in recent years and the named varieties are very numerous. In a work of this kind only the species can be entered. Many of the named garden kinds cannot be definitely referred to botanical species, as they are widely variable derivatives and probably in part the results of old hybridizations. One desiring descriptions of varieties should consult books and reports and the publications of the iris societies. The American Iris Society publishes bulletins.

The classes of iris

The genus separates rather naturally into two divisions: species with rhizomes or rootstocks that are mostly thick and durable; species with a basal bulb rather than rhizome. There is really a third division, with a corm rather than bulb represented by the single species, *I. Sisyrinchium.*

The rhizomatous kinds are again of three main groups: the bearded irises or pogons, in which the basal half of the fall is variously provided with beards or hairs; the crested or evansia irises, in which the falls bear a central ridge or serrated or cockscombed crest; and the beardless irises, or apogons, in which the falls are free of beards or protuberances.

The bulbous kinds may be ranged in three groups: the juno irises, with standards spreading or deflexed and small or even minute, the bulb bearing thick fleshy roots from the base at the resting stage; the xiphiums, or so-called Spanish and English irises, with large and erect standards and smooth bulbs without roots in the resting stage; the reticulatas, differing from the xiphiums particularly in the netted covering of the bulbs and a different nativity.

Included in the general bearded group are associations of various habit and floral characters: the true pogonirises in which the beards or hairs are in a line on the fall and the seeds are without an evident or a conspicuous aril, the rhizomes being stout and more or less regular, and the leaves commonly broad; and other subgroups in which the seeds have prominent cream-colored arils and the beards may be of different character, as the regelias with stolons arising from the main rhizome and flowers 2 or 3 in a spathe and beards in a line on both fall and standard, the pseudoregelias in which the rhizome is compact and without stolons and with hairs in lines on the fall and capsule pointed, and the oncocyclus species with reddish crowded rhizome bearing stolons and 1 flower to a spathe or stem and scattered hairs on the fall.

The apogons or beardless irises are the most numerous in species and the most widely distributed. They are the only ones native in North America, and they occur in the temperate regions of Asia and Europe, often in wet or moist places; the leaves are prevailingly narrow or grass-like. The pogons or bearded irises are native from Portugal and Morocco through southern and central Europe to Asia Minor, Manchuria and western China. The oncocyclus group is small, native in southwestern Asia to Egypt. The evansias or crested irises are a small group in North America and eastern Asia. Regelias are native in the Afghanistan and Turkestan region north of the great mountains, and pseudoregelias east of the Pamirs on the southern side of the Himalayas. The junos are native in the Mediterranean region to Asia Minor, Turkestan and the frontiers of India. The xiphiums proper are in southwestern Europe and northwestern Africa, and the reticulata group in the Caucasus, Asia Minor and southern Palestine.

Cultivation of iris

Irises are planted in either autumn or spring. In the colder parts of the country, spring planting is to be preferred unless transplanted soon after blooming so that the roots become well established before winter; if the bearded iris varieties are divided and planted just after the flowering period, in July or August (in the North) bloom should be obtained the following year, if proper land and care are provided. The kinds with thick heavy rhizomes may be moved when dormant, but those with slender root parts only when new roots are starting so that the plants may become quickly established. Clumps of strong iris should produce 8 or 10 flowering stalks, and the plants should be spaced for this result, say 1½ to 2 feet apart. Irises are durable perennials, but new plantings are likely to give best results in bloom. A little chemical fertilizer should give good returns, but stable-manure is not advised. Winter mulching is desirable in cold climates, particularly the first year. There are diverse opinions and practices as to the cultivation of iris, which indicates that the plants may thrive under varying conditions.

The named horticultural forms of bearded iris (pogoniris) are particularly numerous and constitute the larger part of the current listed varieties aside from the very different Japanese race; they have been known under the collective name of German iris, but this designation is inexact and should be given up (see *Iris germanica*). The bearded horticultural irises are commonly classified as to stature into dwarf, intermediate, and tall. The rhizome is thick and stands near the surface of the ground, and will withstand considerable drying and exposure; the bearded irises require an open sunny exposure and well-drained ground, and should be shallowly planted. It is well to take up the plants about every fourth year, after blooming, remove the old and weak parts of the rhizomes, and replant in newly worked ground.

The horticultural beardless kinds (apogoniris) are of several subgroups, of which the Japanese and Siberian irises are the most prominent (see *Iris Kaempferi*). The rhizome in the apogons is mostly rather slender or fibrous and will not withstand much exposure. Most of the kinds thrive best in moist places; they usually do not prosper with lime. The Japanese irises are of two groups, one derived apparently from *I. Kaempferi* and the other from *I. lævigata*, the common cultivated varieties probably being from the former. *I. Kaempferi* is not a real bog plant and should be kept comparatively dry except when in active growth, at which time the spaces or channels between plants may be filled with water. *I. lævigata*, however, is a bog plant and thrives where continuously wet. Some growers recommend application of liquid manure to Japanese irises just before blooming if specially good flowers are desired.

The regelia and pseudoregelia irises are rather difficult to manage except in mild countries, as southern California, where there are dry and moist seasons, the moisture coming so late that the plants do not start into autumn growth. The roots may be hardy in the East and North but they are dormant in summer and are likely to start in the autumn and be injured. If lifted when the foliage is about ripe, the roots may be kept dry and then planted so late that they will not start till spring. The oncocyclus irises require similar treatment, although the odd *I. susianus* (the commonest one of them in cultivation) is rather difficult to grow permanently.

The horticultural crested irises (evansias) are about a half dozen species, not greatly modified by cultivation. There are no general rules for culture, as they are of various requirements and degrees of hardiness. *I. japonica* thrives in California; *I. tectorum* thrives where the winters do not destroy the evergreen foliage. *I. gracilipes* of Japan and *I. cristata* of North America are hardy and excellent.

The bulbous irises are not generally grown, as they are likely to start into growth in autumn and they may need protection in cold regions. As garden plants, where they can be given good conditions and care, they are excellent because of their showy often orchid-like early bloom. They do well in California, and can be raised successfully also in the northeastern states. They are sometimes bloomed indoors after the manner of tulips, and good results are attained if the bulbs have been properly ripened. The bulbs are planted in autumn for this purpose, in deep pans or boxes, then set outside and brought in as required like other hardy bulbs, or placed in a cool house and then grown on slowly in a temperature of 50° to 55°, for bloom in late winter or early spring.

Propagation of irises is commonly by dividing the rhizomes, or by using the offsets or bulbels in the bulbous species. Each piece of the rhizome should preferably bear at least one strong bud. Bearded irises are commonly divided just after flowering, so that flowering buds may be formed before autumn. Beardless and crested species may be handled similarly, but preferably, as a rule, by division when growth begins in spring.

Seeds commonly germinate readily in spring if sown immediately on ripening the previous year. Transplant into permanent position as soon as the seedlings are large enough to handle; the bearded irises usually bloom the year following germination, but other kinds mostly the second year.

Species of iris cultivated, or so listed, in North America

To economize space in the following brief diagnosis of species, or of plants under Latin names, letters are employed to distinguish the group or association into which the plant falls: B, bulbous; R, rhizomatous; a, apogon or beardless; c, crested (evansia); j, juno; o, oncocyclus; p, pogon or bearded; ps, pseudoregelia; reg, regelia; ret, reticulata; x, xiphium. It is understood that the entries here are for the purpose of accounting for the Latinized binomials appearing currently in lists and literature and not as recommendations. Other Latin-form names appearing in lists are likely to be only hort. vars., particularly of the common bearded irises.

æquiloba: *I. pumila.*

alata (*I. scorpioides*). B, j: nearly stemless, the fl.-tube reaching to the ground: lvs. 6–12 in.: falls 3–4 in. long, blue or sometimes white or variegated white, yellow-keeled, haft broadly winged; standards 1 in. long. Spain to Sicily and Tripoli.

alba: see *I. germanica.*

albopurpurea: *I. lævigata.*

albicans (*R. florentina* var. *albicans*). R, p: much like a white *I. germanica* but lateral fls. closer and on shorter branches that are covered in the scarcely scarious bracts: falls look as if pointed as they hang; standards without hairs or barbs. Probably Arabia; employed in Mohammedan graveyards.

anglica: *I. xiphioides.*

aphylla. R, p: to 15 in., branched below: lvs. glaucescent, 6–12 in., withering in autumn: falls and standards purple, beard white or tipped blue. E. Eu. —Synonyms appearing in lists are *I. biflora, bifurca, bohemica, breviscapa, extrafoliacea, falcata, Fieberi, furcata, hungarica, nudicaulis, reflexa, rigida, Schmidtii, subtriflora.*

arenaria: *I. flavissima.*

atrofusca (*I. Haynei*). R, o: st. about 1 ft. concealed in lf.-sheaths: lvs. about 1 ft., broad: falls veined and dotted red-black, beards yellow tipped brown; standards similarly veined and dotted on gray ground. Palestine.

atropurpurea (*I. Eggeri*). R, o.: st. to 8 in., 1-headed, fls. rather small: lvs. slightly glaucous, about 6 in.: falls somewhat oval, blade nearly black with a yellow and a velvety black patch, beard yellowish tipped purple; standards orbicular, reddish-purple. Syria.—See also *I. germanica* var. *atropurpurea*, another plant.

aurea. R, a.: st. 3 ft. or more, several-fld.: lvs. 2–3 ft.: fls. golden-yellow, 2 or 3 in a spathe; falls with frilled margin. Probably Kashmir.

Bakeriana. B, ret: st. short or none: lvs. cylindrical and hollow, becoming 1 ft. or more, 8-ribbed: fl. fragrant, tube to 6 in. long; falls with violet ovate blade with central white and spotted area; standards deep lilac. Asia Minor, Mesopotamia.

balkana: *I. Reichenbachii.*

Barnumæ. R, o: st. 3–6 in.: lvs. linear, to 6 in.: fl. 1 to a spathe, self-colored, red-purple with darker veins; beard of close yellow purple-tipped hairs. Palestine to Egypt. There are yellow-fld. forms, var. **urmiensis** (*I. chrysantha*). A form with outer lvs. in the tuft falcate is var. **Mariæ** (*I. Mariæ, I. Helenæ*).

Bartoni: *I. kashmeriana.*

bicolor: trade name of uncertain application.

biflora (*I. lisbonensis. I. subbiflora*). R, p: st. to 12 in., with small clasping lvs., and commonly 1 fl. which is deep blue-purple or violet-purple: lvs. to 9 in. long and 1 in. broad; falls obovate, to 2½ in. long, beard blue to yellowish; standards somewhat lighter. Portugal, Spain, N. Afr.—Another *I. biflora* is *I. aphylla.*

bifurca: *I. aphylla.*

biglumis: *I. ensata.*

Biliotti. R, p: like *I. germanica* with red-purple falls and the haft is white with purple-brown veins: stigmatic crests iridescent: spathes long, narrow and green or scarious (if at all) only at the tip. N. E. Asia Minor.

binata: probable hybrid of *I. aphylla* and *I. pumila.*

Bismarckiana. R, o: st. 1 ft. or more, sheathed: lvs. 8 in., broad, glaucous: falls black-purple dotted and veined on cream-yellow ground, and standards with blue on cream-white ground: beard purple-black on yellowish ground. N. Palestine.

Bloudowii (*I. flavissima* var. *Bloudowii*). R, p: st. to 6 in., leaf-bearing only at base, 2–3-fld.: lvs. to 8 in. long and ½ in. broad: falls rounded, yellow and haft veined brownish, beard yellow; standards bright yellow. Turkestan to N. China.

bohemica: *I. aphylla.*

Boissieri (*I. heterophylla*). B, x: st. about 1 ft., with 1 or 2 fls.: lvs. linear, channelled, about 1 ft. long: fall obovate, blue-purple with red-purple veins, yellow on haft, beard yellow; standards purple but reddish on lower part. Portugal.

Bornmuelleri: *I. Danfordiæ.*

bosniaca: *I. Reichenbachii.*

bracteata. R, a: st. 4–12 in., bracted, 1-headed: lvs. few and rigid, linear, exceeding st.: falls broad-oblanceolate, yellow, veined brown-purple; standards short, yellow. Ore.

breviscapa: *I. aphylla.*

bucharica. B, j: st. to 18 in., with 5–7 fls.: lvs. broad, to 1 ft. long, glaucous underneath: falls 2 in. or more long, golden-yellow with white haft and with a wavy golden crest; standards small, pure white. Bokhara, Turkestan.

Bulleyana. R, a: st. to 18 in., hollow, with single head of 1 or 2 fls.: lvs. 18 in. long, ½ in. broad, glaucous underneath: falls obovate, blue-purple on creamy ground; standards oblanceolate, pale blue-purple. W. China, or perhaps a hybrid.

cærulea. B, j.: st. 15 in., with 3–5 fls. in lf.-axils: lvs. about 8, broad, with white edge: falls with obovate-oblong bright lilac blade, crest whitish, yellow blotch in throat; standards to 1 in. long, drooping, lanceolate-pointed. Turkestan.—The name *cærulea* may also be applied to other blue-fld. irises.

californica. R, a: usually referred to *I. macrosiphon* but differs in greater size (st. to 16 in. high), fls. cream-color with lilac veins. Calif.

caroliniana (*I. georgiana*). R, a: st. 2–3 ft., the fls. pedicelled, solitary or 2–3 together: lvs. bright green, 1 in. broad more or less, equalling or exceeding the st.: falls broad-spatulate, to 3 in. long, lilac marked yellow, purple and brown; standards nearly erect. Va. to La. —Sometimes combined with *I. versicolor* but separated by green lvs. and seeds in 1 row (rather than 2 rows) in each cell.

Cengialti. R, p: st. to 1 ft., 1–3-headed: lvs. about 6 in. long, slightly glaucous: falls broad-obovate, blue-purple, haft veined, beard white tipped orange; standards somewhat lighter color than falls. S. Tyrol, N. Italy.—Probably a form of *I. pallida*, distinguished by less glaucous foliage and spathes pale brown rather than silvery and of more slender and lower habit.

Chamæiris (*I. italica. I. lutescens. I. olbiensis. I. virescens*). R, p: st. 1–10 in., commonly 1-headed and fls. mostly 2 to spathe: lvs. 3–6 in. long and ½ in. broad, slightly glaucous: falls obovate, blue, red-purple, yellow or white, beard of same range but usually contrasting; standards slightly shorter; tube about 1 in. long. N. W. Italy and adjacent France.—Often sold as *I. pumila.*

chinensis: *I. japonica.*

chrysantha: *I Barnumæ* var. *urmiensis.*

chrysographes. R, a: st. to 18 in., hollow, with 1 or 2 small lvs., the other lvs. to 18 in. long, ½ in. broad: falls oblong, deep violet-velvety-purple, haft with golden veins; standards oblanceolate, deep violet. W. China.—Of the *I. orientalis* type.

chrysophylla. R, a: probably a form of *I. californica* with lanceolate stigma-crests to ¾ in. long. S. Ore.

Clarkei (*I. himalaica*). R, a: like *I. sibirica*, but st. solid and usually branched, lvs. shining above and glaucous underneath, spathes all herbaceous and green. Himalayas, 6,000–11,000 ft.

Clusiana: a confused name, applied to two or three species.

concolor: one of the forms of bearded iris, probably to be associated with *I. sambucina.*

coreana is listed.

cretensis, cretica: *I. unguicularis.*

cristata. R, c: st. 1–3 in. high, 1–2 fld.: lvs. about 6, to 9 in long and ¾ in. broad: fls. blue, segms, obovate, to 1½ in. long, the falls little longer than standards and bearing a white and yellow more or less dotted crest; tube slender and exceeding the spathes. Md. to Ga. and Mo.

cuprea: *I. fulva.*

cypriana. R, p: st. about 3 ft., with terminal head of 3 fls. and 2 or 3 lateral heads: lvs. somewhat blue-green, rather narrow, 2 ft.: falls wedge-shape, blue-lilac, beard whitish; standards paler than falls. Cyprus.

dahurica: *I. flavissima.*

Danfordiæ (*I. Bornmuelleri*). B, ret: st. 2–4 in., 1-headed: lvs. 2, at first short but becoming 12 in., 4-sided: falls with ovate-lanceolate orange blade veined and dotted olive-green; standards reduced to small bristles. E. Asia Minor.

Delavayi. R, a: st. 3–4 ft. or more, hollow, with 2 or 3 heads: lvs. to 2½ ft. and to 1 in. broad, glaucescent: falls orbicular and notched, violet-purple with white patch and markings; standards lanceolate, small. S. W. China.

demawendica. R, o: st. 6 in., with 1 lf. and fl.: lvs. 6–8 in. long, almost linear: falls deep violet-purple, veined and dotted, beard dark; standards paler. N. Persia.—Perhaps a form of *I. iberica.*

dichotoma. R: single representative of the pardanthopsis section (Pardanthus-like) with many fls. in racemes on forked sts. 2 ft. or more high: lvs. 6–8, bluish-green and white-edged, to 12 in. long, borne fan-shaped: blade of falls nearly square and horizontal, white with brown-purple spots, haft barred and flecked; standards grayish-white striped purple. Siberia to N. China.—Fls. late and then usually dies; seeds quickly produce new flowering plants; very floriterous.

Douglasiana (*I. Watsoniana*). R, a: st. to 20 in., simple and 1-headed or sometimes branched: lvs. equalling or surpassing st., about ½ in. broad: fls. variable, lilac-purple to cream-white or white; blade of falls broadly oblanceolate, standards lanceolate and somewhat shorter. Calif., Ore.

Eggeri: *I. atropurpurea.*

elongata: *I. scariosa.*

ensata (*I. biglumis*). R, a: making close clumps: st. 6–16 in. high, flattened, 1-headed: lvs. linear, equalling or exceeding st.: fls. lilac to white, sometimes finely veined, rather small; blade of falls oblanceolate; standards usually darker than falls. Cent. Asia, China, Japan. Var. **pabularia** (*I, pabularia*) is large and robust, 2–3 ft., producing much foliage, once intro. for forage under the name "krishum," withstanding drought.

Eulefeldi: *I. scariosa.*

extrafoliacea: *I. aphylla.*

falcata: *I. aphylla.*

Fieberi: *I. aphylla.*

Fisheri: listed name of a dwarf bearded iris.

filifolia. B, x: st. to 18 in. or more, 1-headed and usually 2-fld.: lvs. 1 ft. or more, very slender: fls. reddish-purple with darker veins; falls with orbicular blade and orange central patch; standards obovate and emarginate. S. Spain, N. W. Afr.

fimbriata: *I. japonica* or *I. tectorm.*

flavescens. R, p: st. 2–2½ ft., with 2–4 heads, the spathes not inflated and dry (scarious): lvs. about half as long as st., to 1½ in. broad: falls obovate-cuneate, 2½ in. long, blade pale yellow to nearly white with brownish veins, beard yellow, standards obovate, pale lemon-yellow. Probably a hybrid.—The name *flavescens* is sometimes applied to *I. imbricata.*

flavissima (*I. arenaria. I. dahurica*). R, p: st. 1–3 or 6 in., 1-headed with 2 or 3 yellow fls.: lvs. 3–4 and about 3–8 in. long, very narrow: falls oblong, the haft faintly veined brown-purple, beard orange; standards oblong-clawed, veined brown-purple on edge. Hungary to Mongolia.

florentina: *I. germanica* var.

floribunda: trade name for a bearded iris.

fœtidissima. GLADWIN. R, a: st. 2–3 ft., 2- or 3-headed: lvs. to 1½ ft. and 1 in. broad, evergreen, ill-smelling when bruised: fls. small or inconspicuous, purplish-gray (but a yellow-fld. form); blade of falls nearly orbicular and slightly notched at end; standards narrow. W. and S. Eu. and N. Afr.—Grown for the striking large pods that open in autumn and display the many scarlet globular seeds.

foliosa. R, a: st. zigzag and to 18 in.: lvs. green, to 1½ in. broad and surpassing the blue-purple fls.: falls with ovate blade with greenish-white patch; standards oblanceolate. Ky. to Kans.

Fontanesii. B, x: like a slender *I. tingitana*, but color clear light blue and central yellow band on rounded falls. Morocco.

Forrestii. R, a: much like *I. Wilsoni* but more slender: sts. to 18 in.: lvs. narrow and glossy, not equalling st.: fls. clear yellow, sometimes with inconspicuous purplish veins; standards almost erect. S. W. China, at high altitudes.

fragrans: doubtful name in the lists; may be *I. ensata*.

fulva (*I. cuprea*). R, a: st. rather slender, 2–3 ft., several-fld.: lvs. somewhat glaucous, equalling or less than st., to 1 in. broad: fls. reddish-brown or copper-colored, variegated blue and green; falls oblanceolate, 2½ in. long; standards emarginate. Ga. to Ill., Mo. and Tex.

furcata: *I aphylla*.

Gatesii. R, o: st. to 18 in., spathe 1-fld.: lvs. glaucous, to ¾ in. broad, to 12 in. long: fls. very large, the under color pale greenish or grayish-white with close purplish veins and dots; blade of falls and standards 4–5 in. across. Asia Minor.

georgiana: *I. caroliniana*.

germanica (*I. vulgaris*). R, p: st. about 2 ft., bearing 4 or 5 fls.: lvs. glaucous, to 18 in. long and 1½ in. broad: blade of falls obovate, reddish shade of blue-purple, beard white more or less tipped yellow; standards obovate, blue-purple, the claw often bearing a few whitish hairs. Perhaps Medit. but unknown native.—The forms of this plant are many and they constitute one source of the cult. tall bearded irises, and these vars. are frequently known as "German irises" but this vernacular should be discarded; *I. pallida*, *I. variegata* and other species are involved. Var. **florentina** (*I. florentina* of many authors, var. *alba*) has fls. nearly white, with traces of pale blue or purple, plant rather slender; one of the sources of the perfumed orris-root. Var. **nepalensis** (*I. nepalensis*, *I. germanica* var. *atropurpurea*), Purple King, has red-purple fls., the falls being darker.

glaucescens: *I. scariosa*.

Gormani. R, a: sts. slender, 1-fld., to 16 in. high: lvs. linear, those on st. 2 or 3: fls. cream-color to pale yellow; sepals or falls ascending, more or less spatulate, about 1¼ in. long; petals or standards erect, somewhat shorter. Coast mts., Ore.

gracilipes. R, c: slender, st. to 10 in., forked: lvs. to 1 ft. long and ⅓ in. broad: falls about 1 in. long and ½ in. broad, notched, pink-lilac with deeper veins and central patch of white, crest yellow; standards narrower, pink-lilac. Japan.

gracilis: name of various applications, perhaps most correctly an albino-like form of *I. aphylla* with fls. pale yellowish or grayish-white somewhat splashed purple; also a synonym of *I. prismatica*.

graminea. R, a: st. 8–9 in., 2-edged, its lvs. sometimes surpassing the 1 or 2 fragrant fls.: lvs. grass-like, mostly very narrow but sometimes 1 in. broad, 1–3 ft. long: blade of falls orbicular, yellowish-white veined purple; standards broad-lanceolate, somewhat redder. Cent. and S. Eu. to Caucasus.

Grant-Duffii. R, a: st. 6 in., 1-headed: lvs. linear, 18 in.: blade of falls obovate, yellow with orange patch; standards oblanceolate, yellow with lilac or purple on claw. Palestine, S. E. Asia Minor.

Gueldenstadtiana: *I. halophila*.

halophila (*I. Gueldenstadtiana*). R, a: st. 12–18 in., with 2 or 3 heads: lvs. mostly exceeding sts., ample: fls. rather small; blade of falls rounded and ½–¾ in. broad, white veined purple, dull yellow or gray-purple; standards shorter and erect. Caucasus to N. W. India.—Allied to *I. spuria*, but known by the small horizontal blade of fall.

Hartwegii. R, a: st. to 1 ft., flattened, its lvs. 1–3: lvs. linear, longer than st.: fls. 2, yellow with lavender veins, or pale lilac with deeper veins and yellow patch; falls obovate-cuneate; standards oblanceolate, a little longer than falls. Coniferous forests, N. Calif.

Haynei: *I. atrofusca*.

Helenæ: *I. Barnumæ* var. *Mariæ*.

heterophylla: *I. Boissieri*.

hexagona. R, a: st. to 3 ft., mostly simple, leafy: lvs. 2–3 ft. and to 1½ in. broad: fls. solitary and sessile; falls with obovate lilac or sometimes white blade to 4½ in. long; standards much narrower and erect, lilac varying to white. Swamps, S. C. to Fla. and Tex.

himalaica: *I. Clarkei*.

hispanica: *I. Xiphium*.

Histrio. B, ret: st. short or almost none, 1-headed: lvs. 4-angled, to 1 ft. long, usually appearing before the fls.: falls obliquely ascending, the blade deep blue on margins and creamy-white and blotched in center, to 2½ in. long; standards oblanceolate, blue. Syria, Asia Minor.—Differs from *I. reticulata* in lighter colored odorless earlier fls.

histrioides. B, ret: like *I. Histrio* but fls. arise about as soon as lvs. appear, and the falls stand nearly horizontal and central patch is narrower; bright blue-purple, with central white blotched area and yellow ridge: lvs. stout. N. Asia Minor.

Hoogiana. R, reg: st. 18–20 in., fls. 2 or 3 in 1 head: lvs. to 18 in. and ¾ in. broad: fls. large, of uniform gray-blue or blue-purple, with thick golden beard; falls about 3 in. long; standards erect-connivent, broad at top. Turkestan.

Hookeri: see *I. setosa*.

humilis. R, a: st. about 1 in. high, 2-lvd.: lvs. linear, to 1 ft. or so: blade of falls nearly orbicular, deep blue-purple with darker veins, haft with greenish-yellow to white under color veined reddish-brown; standards oblanceolate, blue-purple. Transylvania to Caucasus and perhaps beyond.—Another *humilis* is a form of *I. unguicularis*.

hungarica: *I. aphylla*.

iberica. R, o: st. 3–6 in., 1-fld.: lvs. 5 or 6, linear, glaucous, 4–6 in. long: blade of falls nearly orbicular, about 3 in. long, with whitish-yellow ground, brownish-purple veined and triangular patch of purplish-black; standards with orbicular connivent blades silvery-white dotted and veined purplish or brownish. Caucasus to N. Persia.

imbricata (*I. sulphurea*). R, p: st. to 20 in., bearing several heads, the spathes inflated and green: lvs. broad, 6–8 in. long at flowering time, the outer ones obtuse: falls obovate, greenish-yellow veined brown-purple on haft and sometimes on blade, the beard whitish tipped orange; standards rounded-oblong, greenish-yellow. S. W. Asia.—Separated from *I. flavescens* by the spathes.

interregna: hort. name.

italica: *I. Chamæiris*.

japonica (*I. chinensis*). R, c: st. 18 in., branched and many-headed: lvs. to 2 ft. and 1–2 in. broad, glaucous underneath: falls obovate, serrate, about 1½ in. long, white in center bordered with mauve, circumference mauve or lilac, the crest white tipped orange; standards oblong and serrate, nearly horizontal, lilac. Japan, China.—Individual fls. short-lived.

juncea. B, x: st. about 1 ft., with 1 or 2 golden-yellow fls.: lvs. narrow, about 18–24 in. long, mostly appearing in autumn: falls about 2¼ in. long, the blade nearly orbicular, emarginate, usually faintly brown-veined in lower part; standards much shorter, spreading. Sicily, N. Afr.

Junonia. R, p: st. to 2 ft., with usually 5 heads: lvs. shorter, about 1¾ in. broad, glaucous: falls obovate, about 3½ in. long, the blade light purple, beard white tipped orange; standards obovate, pale blue, sides reflexed. Asia Minor.

Kaempferi (*I. lævigata* var. *Kaempferi*). JAPANESE I. R, a: st. to 2 ft. or more, with terminal head of 2 fls. and commonly a lateral head: lvs. to 2 ft. and more, with a marked midrib: fls. reddish-purple (in the wild); falls hanging, 3 in. long, blade oval or obovate, the haft with yellow center; standards about ⅔ as long as falls, narrow, also reddish-purple. Manchuria, N. China, Japan.—Source of numberless cult. forms, varying in form and color of fl.; sometimes the fl. is partially double due to the style becoming petal-like. See *I. lævigata*.

kashmeriana (*I. Bartoni*). R, p: st. about 2 ft., with 1 or 2 fragrant fls. in 1–3 heads, spathes 3 or 4 in. long: lvs. to 20 in., glaucous: falls obovate, blade creamy-white, sometimes tinged blue, beard white and yellow; standards white. Kashmir, Afghanistan, Baluchistan.

Kochii. R, p: probably a form of *I. germanica*, rather dwarf (st. mostly about 18 in., sometimes 2 ft.), fls. red-purple without white under color displayed between the brownish veins at end of haft. Istria.

Korolkowi. R, reg: st. about 1 ft., with 2 or 3 small lvs. and 2 or 3 fls. in one head: lvs. glaucous, about 1 ft. long: falls obovate, pale olive-green with brown veins; standards erect, obovate, whitish with brown veins. Turkestan.

kumaonensis. R, ps: st. practically none or seldom 2–3 in., 1-headed and 1- or 2-fld.: lvs. glaucous, finally becoming 18 in. long: fls. bright lilac or blue-purple; blade of falls oblong-ovate, veined and mottled, haft white with purplish veins. Himalaya, at high altitudes.

lacustris (*I. cristata* var. *lacrustris*). R, c: differs from *I. cristata* in its commonly smaller size and rather narrower lvs., and perianth-tube only 1 in. or less long and not exceeding spathes: fls. blue. Shores, Lakes Huron, Michigan, Superior.

lævigata (*I. albopurpurea*). R, a: like *I. Kaempferi* but lvs. lacking distinct midrib, standards as long as falls, fls. blue-purple (in wild). E. Asia, China, Japan.—Source of some of the irises grown by the Japanese.

Leichtlini: *I. stolonifera*.

lisbonensis: *I. biflora*.

longiflora: *I. scariosa*.

longipetala. R, a: st. to 2 ft., 1-headed or with 1 or 2 lateral heads: lvs. narrow, equalling or exceeding st.: fls. bright lilac; falls obovate, drooping, central ridge yellowish; standards oblanceolate. Coastal Cent. Calif.—See *I. missouriensis*.

Lortetii. R, o: st. about 1 ft., bearing 1 large beautiful fl. with creamy-white under color closely veined and dotted crimson: falls obovate, reflexed, with dark crimson patch, beard of scattered brown hairs; standards orbicular, 3–4 in. broad, erect. Mt. Lebanon.

lupina: *I. Saarii*.

lurida (*I. Redoutiana*). R, p: st. about 18 in. high, 1-headed with 2 fls. and sometimes 1 lateral fl.: lvs. rather narrow, reaching 1 ft.: falls long and narrow, blade reddish-maroon, beard prominent ot orange hairs; standards oval, emarginate, brownish-purple. Probably of garden origin.

lusitanica: *I. Xiphium*.

lutea: *I. Pseudacorus*.

lutescens: confused name; perhaps *I. Chamæiris*.

macedonica: *I. Reichenbachii*.

macrantha: hort. name of a tall bearded iris.

macrocarpa: listed name of a dwarf bearded iris.

macrosiphon. R, a: st. very short but sometimes to 8 in.: lvs. very narrow, exceeding sts.: fls. 1 or 2, bright lilac-purple; falls 2 in. long, broadly oblanceolate; standards lanceolate, edges undulate. Cent. and N. Calif.

maculata: uncertain name.

major: name applied to large forms.

mandshurica. R, p: yellow-fld. plant like *I. flavissima*, apparently not in cult. although the name is in the hort. literature.

Manissadjani: *I. Saarii*.

mardinensis: listed name (Mardin is in Armenia).

Mariæ: *I. Barnumæ* var.

mellita (*I. rubro-marginata*). R, p: st. to 4 or 5 in., 1-headed: lvs. 3–5 in. long and ½ in. broad: fls. of delicate texture, fragrant, brown-purple (varying to yellow); falls obovate, shorter than the standards. S. E. Eu., Asia Minor.—Differs from *I. pumila* in more rigid keeled herbaceous spathes.

mesopotamica. R, p: large, the st. 3–4 ft., erect, 3 fls. in terminal head and 2 in lateral ones: lvs. to 2 in. broad and 2 ft. long: fls. lavender-blue; blade of falls obovate, haft nearly white overlaid with purple-bronze veins, beard white and orange; standards obovate, somewhat lighter than falls. Probably Armenia.—Under the form known as *I. Ricardi* it has entered into the development of hort. tall bearded irises.

Milesii. R, c: vigorous, st. to 3 ft., spathes with 2, 3 or more reddish-purple rather small fls.: lvs. 2 ft. or more and 2–3 in. broad: blade of falls about 1¼ in. long, oblong and emarginate, darker veined and blotched, crest orange and purple; standards 1¾ in. long, oblong with tooth in center of notch. Himalaya.

missouriensis (*I. Tolmieana. I. longipetala montana*). R, a: st. mostly simple and rather slender, 6–24 in. high, much like *I. longipetala* but usually not so tall and spathes dry (scarious) rather than foliaceous (green) and lvs. commonly shorter than st.: fls. pale blue and variegated. S. D. to B. C., S. Calif. and Ariz.

mongolica: listed name.

Monnieri. R, a: perhaps a color form of *I. ochroleuca*, the fls. soft lemon-yellow: blade of falls 1½ in. broad, orbicular, emarginate; standards oblong-cuneate, 3 in. long. Probably of garden origin.

mussulmanica: probably *I. halophila*.

neglecta. R, p: st. to 2 ft., with many fls.: lvs. shorter, somewhat glaucous: falls obovate and very obtuse, 2 in. long, margin violet-blue, center whitish-veined and blue, beard yellow; standards lilac. In cult. only; probably a hybrid, and the name does not have definite standing.

nepalensis: *I. germanica* var.

notha: dubious name, probably to be associated with *I. spuria*.

nudicaulis: *I. aphylla*.

ochroleuca (*I. orientalis* of some authors). R, a: st. 3 ft. and more with terminal head and lateral ones: lvs. 2–3 ft. and 1 in. or more broad, with a spiral twist: fls. commonly white with patch of golden-yellow on falls which have an orbicular blade; standards lemon-yellow to whitish. W. Asia Minor.

olbiensis: *I. Chamæiris*.

orchioides. ORCHID I. B, j: st. jointed, 1 ft. or so, leafy with 3 or more fls. solitary in the axils: lvs. 9 in. or more long, 2 in. broad: fls. not large, deep yellow but variable; falls ovate, with greenish and darker color either side crest; standards small, commonly deflexed. Turkestan.

orientalis (*I. sibirica* var. *orientalis. I. sanguinea*). R, a: st. hollow, with terminal head of 2 or 3 fls.: lvs. to 18 in., usually exceeding the st., to ½ in. broad: fls. typically rich blue-purple (white under color) but sometimes white; falls with nearly orbicular blade; standards broad-oval, a little shorter than falls, blue-purple or white. Manchuria, Japan.—Two plants have passed under this name: see *I. ochroleuca*.

pabularia: *I. ensata* var.

pallida. R, p: much like *I. Cengialti* but a tall and stouter iris, sts. 2–3 ft., spathes silvery-white: lvs. glaucous: fls. pale lavender-blue; falls obovate, beard white tipped yellow; standards obovate, somewhat paler than falls. S. Tyrol.—One of the most important sources of tall bearded irises of gardens. Var. dalmatica is a garden form.

panormitana: *I. pseudo-pumila*.

paradoxa. R, o: st. to 6 in., spathe 1-fld.: lvs. linear, to 6 in.: fl. large, showy; falls narrow, 2 in. long and ¾ in. or less broad, horizontal, pale pinkish-crimson with purple-black hairs; standards orbicular, blue or white under color with blue-purple veins and dots. Caucasus to N. Persia.

parisiensis: a listed name.

pavonia: *Morea pavonia*.

persica (*I. præcox*). B, j: st. not evident, with 1 or 2 fls.: lvs. linear, 2–3 in. long but becoming twice that length: fls. white tinged with pale greenish-blue or sea-green; blade of fall to 2½ in. long, rounded-oblong, with orange ridge and patch of purplish; standards about ¾ in. long. E. Asia Minor, Persia.

plicata: hort. name of a tall bearded iris like an albino *pallida*, origin unknown.

Plumeri: hort. name, a tall bearded variety.

præcox: *I. persica*.

prismatica. R, a: st. slender, to 3 ft., mostly simple: lvs. narrow, somewhat glaucous, usually shorter than st.: fls. solitary or 2, blue or violet veined yellow; falls to 2 in. long, the blade ovate, lighter at base; standards shorter, lanceolate. N. S. to Ga.

Pseudacorus (*I. lutea*). YELLOW FLAG. R, a: stout st. to 3 ft. or more, commonly several-fld.: lvs. more or less glaucous, to 1 in. or more broad and equalling or surpassing st.: fls. not large, bright yellow; falls about 2 in. long, the blade broadly obovate to ovate, often veined violet; standards shorter, oblong, nearly erect. Widespread in Eu., N. Afr., Asia Minor; nat. in E. N. Amer.

pseudo-pumila (*I. panormitana*). R, p: like *I. Chamæiris* but spathes narrower, fl. usually 1 and tube 2 or 3 in. long: from *I. pumila* distinguished by st. longer than fl.-tube: st. 4–6 in.: fls. purple, yellow or white. S. Italy.

pumila (*I. æquiloba. I. stenoloba. I. taurica. I. transsilvanica. I. tristis*). R, p: resembles *I. Chamæiris* but almost or quite stemless and fl.-tube 2 or 3 in. long, thus exceeding the st.: fls. varying from yellow to bright or dark lilac. Austria to Russia and Asia

Minor.—Variable in cult., and the true or original species may not appear.

Purdyi. R, a: differs from *I. Douglasiana* in the sts. bearing somewhat overlapping inflated and sheathing bract-like lvs.: st. to 1 ft.: lvs. exceeding st. and about ¼ in. broad: fls. 2, cream-color with purple and yellow lines. N. Calif., Ore.

pygmæa: hort. name for a dwarf bearded iris.

Redoutiana: *I. lurida.*

reflexa: *I. aphylla.*

Regeli: *I. tenuifolia.*

Reichenbachii (*I. balkana. I. bosniaca. I. macedonica. I. serbica*). R, p: eastern representative of *I Chamæiris*, and has sharply keeled spathes: st. 3–12 in., 1-headed: fls. delicate in texture, clear yellow varying to brownish-purple. S. Hungary, Balkans.

reticulata. B, ret: st. none until fr. matures, the single fl. being raised on a long tube: lvs. linear and 4-angled, 8–10 in. but becoming 2 ft.: falls with long haft and small oval blade which is deep violet, marked veined and spotted, with orange ridge; standards slightly longer, 2½ in., narrow, erect, deep violet. Caucasus.—The name *reticulata* is also given to a tall bearded garden iris.

Ricardi: *I. mesopotamica.*

rigida: *I. aphylla.*

Rosenbachiana. B, j: st. very short or practically none, with 1–3 fls. in axils: lvs. channelled, 1–2 in. long but becoming 9 in. long and 2 in. broad: fls. brilliant, variable in color; falls long-oblong, about 2 in. long, blade dark crimson-purple and other parts of fl. faint purple or white; standards about 1 in. long. Turkestan.

rubro-marginata: *I. mellita.*

ruthenica. R, a: st. to 8 in., 1-headed: lvs. linear and grass-like, 6 in. but becoming 1 ft.: falls broad-oval, under color creamy-white overlaid with blue dots and veins; standards lanceolate, deep purple-violet. E. Eu. to N. China and Korea.

Saarii (*I. lupina. I. Manissadjani*). R, o: st. about 6–8 in., concealed in lf.-sheaths: lvs. linear, becoming 1 ft. long: falls 3 in. long and half as broad, under color yellow or greenish with brownish-red veins giving a lilac effect, beard bright yellow; standards larger, nearly orbicular, connivent, somewhat darker. Asia Minor.—Latterly but not originally written *Sari.*

sambucina. Bearded iris related to *I. squalens*, probably a hybrid: plant less robust, the fls. veined claret-color and with a sambucus-like odor.

sanguinea: *I. orientalis.*

scariosa (*I. elongata. I. Eulefeldi. I. glaucescens. I. longiflora*). R, p: st. to 6 in. or so, bearing 1 or 2 red-purple fls. with darker veins on falls, the spathes to 2½ in. long, dry and more or less transparent: lvs. very glaucous, to 1 ft. or so long and ¾ in. broad: falls obovate, reflexed, 1¾ in. long, beard yellow and white; standards obovate. Caspian Sea to Turkestan and Altai.

Schmidtii: *I. aphylla.*

scorpioides: *I. alata.*

serbica: *I. Reichenbachii.*

setosa. R, a: st. stout, forked, bearing 2 or 3 heads: lvs. to 2 ft. long and 1 in. broad, much shorter than st.: falls more or less orbicular, light lilac or purple and often with reddish tinge; standards ¾ in. or less long, various in shape. N. Asia.—Represented Me. northward by *I. Hookeri* (*I. setosa* var. *canadensis*), very similar.

Shrevei. R, a: st. to 3 ft., with 1 or 2 branches: lvs. frequently somewhat glaucous, as long as st.: falls lavender-blue with flecks and lines, to 2½ in. long, recurved-spreading; standards light violet with darker tints, as long as falls. Marshes, Cent. U.S.

sibirica. R, a: st. hollow, with a 2–5-fld. terminal head and commonly a lateral head: lvs. to 1–2 ft. and much shorter than st., linear: falls lilac-blue or blue-purple, the blade orbicular (varying to grayish); standards broad-lanceolate, shorter. Cent. Eu., Russia.—It runs into several forms.

sindjarensis. B, j: st. to 9 in., bearing 3 or more pale blue large fls.: lvs. to 10 in. long and 2 in. broad: falls with large wings, blade rounded-oblong, with yellowish central ridge; standards obovate or narrower, horizontal or deflexed. Syria and Mesopotamia.

Sisyrinchium (*Moræa Sisyrinchium*). Sole member of the Gynandriris section, producing a corm in place of bulb and the stamens adhering to the style-branches: st. to 1 ft., bearing usually several heads of fugitive lavender or lilac or blue-purple fls.: lvs. few, to 1 ft. or more long: falls to 1½ in. long, lanceolate to obovate, with white patch; standards a little shorter. Portugal and Medit. region to Cent. Asia.

sofarana. R, o: like *I. susiana* but under color creamy-white and veins dark purple. Mt. Lebanon.

spectabilis: *I. Xiphium;* the name is also given to a tall bearded garden iris.

spuria. R, a: sts. with 3 or 4 reduced lvs. and 1–3 spicate heads: lvs. glaucous, linear, 1 ft. long and shorter than st.: fls. blue-purple or lilac, the rather shorter standards somewhat redder; falls with nearly orbicular blade 2 in. long. Cent. and S. Eu. and Algeria, to Persia.—Variable in color and habit.

squalens. R, p: sts. 2–3 ft., with 3 or 4 heads: lvs. glaucous, to 1½ ft. long and 1½ in. broad: falls obovate, the blade to 3 in. long, lilac-purple, haft same with whitish or yellowish under color, beard bright yellow; standards as long and broad as falls, lilac or brownish with yellow. Cent. Eu. to Persia.—Perhaps a series of forms of tall bearded iris and not a natural species.

Statellæ: form of *I. pseudo-pumila.*

stenoloba: *I. pumila.*

stenophylla: one of the many forms of *I. persica:* also a hort. name for a dwarf bearded iris.

stolonifera (*I. Leichtlini. I. vaga*). R, reg: st. to 2 ft., covered with clasping lvs., with 1–3 fls. in a single head: lvs. to 1½ ft.: fls. usually light or dark brown-purple, marked in middle of the frilled segms. with blue; falls reflexed, obovate, about 1 in. broad, haft yellow-bearded; standards of similar size, erect. Turkestan.

stylosa: *I. unguicularis.*

suaveolens. R, p: st. to 5 in., 1-fld.: lvs. becoming 1 ft. long, glaucous: fls. greenish-yellow, very fragrant; falls oblong-cuneate, with central mark of lilac-blue, beard yellow; standards broader, crisped. Bulgaria.—Like *I. pumila*, but segms. much broader.

subbiflora: *I. biflora.*

subtriflora: *I. aphylla.*

sulphurea: *I. imbricata.*

susiana. MOURNING I. R, o: st. to 15 in., with few reduced lvs., 1-headed and 1-fld.: lvs. linear, 1 ft. or more: fls. large, under color gray overlaid with purple-black veins; falls 3–4 in. long, the blade ovate, with black patch, beard broad and brownish; standards orbicular, somewhat lighter. Probably Asia Minor and Persia.—An old garden plant.

Taitii: *I. Xiphium.*

taurica: *I. pumila.*

tectorum (*I. tomiolopha*). R, c: st. 1 ft. or more, with 2 or 3 heads: lvs. to 1½ ft. and 2 in. broad: fls. deep lilac or blue-purple, segms. nearly or quite horizontal; falls 2 in. long, blade obovate or nearly orbicular, mottled darker shade, crest cut and white-violet; standards obovate. China.

tenax. R, a: st. to 1 ft., with bract-like lvs.: basal lvs. longer than st., linear: fls. solitary, bright lilac-purple (varying to white); falls lanceolate, about 2 in. long, with yellow ridge; standards nearly as long. W. Ore. and Wash.

tenuifolia (*I. Regeli*). R, a: st. 6 in. or less, sheathed: lvs. rigid, less than ¼ in. broad, to 1 ft. long: fls. with very slender tube to 4 in. long; falls blue-purple, with wedge-shaped haft; standards oblanceolate, about as long as falls. Cent. Asia to China.—Rhizome very slender.

Tigridia. R, p: small, in dense masses: st. 1–3 in., 1-headed: lvs. narrow-linear, to 6 in.: fls. blue-purple or yellow; falls reflexed, 1¼ in. long, narrow; standards of similar length. N. E. Asia.

tingitana. B, x: large: st. to 2 ft., with 2 fls. and lvs. clasping: basal lvs. 12–18 in.: fls. 3 in. long. blade nearly orbicular, light blue or lilac with orange-yellow ridge; standards narrow, blue-purple. Tangiers (whence the name), Morocco.

Tolmieana: *I. missouriensis.*

tomiolopha: *I. tectorum.*

transsilvanica: *I. pumila.*

tricuspis: *Morea tricuspis.*

tristis: *I. pumila.*

trojana. R, p: st. 2 ft. and more: lvs. somewhat glaucous, shorter than st.: fls. large; falls obovate, blue- or violet-purple with a somewhat reddish tint, beard white and yellow; standards obovate and rounded, light blue-purple. Intro. from region of ancient Troy (Asia Minor) but nativity uncertain.

unguicularis (*I. cretensis. I. stylosa*). R, a: st. very short or practically none: lvs. linear, becoming 2 ft. long: fl.-tube 5–6 in. or more long; falls to 3 in. long, blade broad-obovate, bright lilac with central area of deep lilac on a lighter under color; standards oblong. Algeria, Greece, Asia Minor, Syria.—Blooms in autumn or earliest spring.

urmiensis: *I. Barnumæ* var.

vaga: *I. stolonifera.*

variegata. R, p: st. 12 in. or more: lvs. 8 in. long or those of non-flowering shoots to 18 in.: fls. with obovate falls yellow variegated chestnut or purple, rounded-oblong standards yellow; beard yellow or orange. Austria, Balkans.—Considered to be the source of the yellows in the tall bearded irises. Var. **honorabilis** is yellow shaded brown. The name *variegata* is also applied to striped-lvd. forms of other irises.

Vartani. B, ret: st. none or practically so: lvs. 4-angled, to 9 in. and becoming 18 in.: fl. slaty-lilac or grayish (varying to white); falls with lanceolate blade with darker veins, yellow crest on the haft; standards narrow-lanceolate with faint veins. Palestine.

verna. R, a: early-blooming: st. to 3 in. high and mostly 1-fld.: lvs. narrow-linear, to 8 in.: fls. violet-blue (to white); falls obovate, 1½ in. long, with slender yellow haft, standards erect, somewhat smaller. Pa. to Ga.

versicolor. R, a: st. to 3 ft., often branched: lvs. somewhat glaucous, shorter than st., to 1 in. broad: fls. purplish-blue; falls ovate to reniform-ovate, to 3 in. long, the spot at base, if present, greenish; standards shorter and narrower, about ¾ in. or less broad. The common iris from E. Canada to Pa. and Minn.

violacea: indefinite name; may be *I. pumila, I. germanica,* or violet forms of other species.

virescens: *I. Chamæiris.*

virginica: formerly referred to *I. versicolor,* but now considered to be distinct and ranging from Mich., Wis. and Neb. to the Gulf: lvs. to 2 in. broad: fls. bright blue; falls oblong-ovate to ovate, with bright yellow pubescent spot at base; standards to 1 in or more broad.

vulgaris: *I. germanica.*

warleyensis. B, j: related to *I. orchioides*: differs in having white hard edge on lvs. and falls velvety violet-purple often edged white, crest white and often surrounded by orange patch: st. to 18 in., with 3–5 fls. Turkestan.

Watsoniana: *I. Douglasiana.*

Willmottiana. B, j: st. to 8 in., with several fls. sessile in axils: lvs. broad and nearly flat, with whitish hard edge: fls. blue-purple or reddish-purple on oblong blade with white veined patch; standards small, cuspidate. Turkestan.

Wilsoni. R, a: st. hollow, about 2 ft., with 1 head of 2 fls.: lvs. slightly glaucous, about equalling st.: fls. long-pedicelled, not large; falls pale yellow veined in bright yellow center with reddish-brown, the blade ovate; standards narrow, yellowish-white with faint purple veins and frilled edges. China.

xiphioides (*I. anglica*). ENGLISH I. B, x: st. to 18 in. with 1 head of 2 or 3 fls.: lvs. channelled, equalling st.: falls with short broadly cuneate haft bearing large wings, blade nearly orbicular, deep blue-purple with golden patch but colors variable under cult.; blade of standards almost orbicular, shorter than falls; pedicels shorter than spathe. Pyrenees.

Xiphium (*I. hispanica. I. lusitanica. I. spectabilis. I. Taitii*). SPANISH I. B, x: st. to 18 in., 1- or 2-fld.: lvs. to 2 ft., glaucous, channelled: falls with long oval haft separated from nearly orbicular blade by a narrow neck making it somewhat fiddle-shaped, color variable but in wild plants mostly blue-purple or pale slaty-blue, blade with yellow or orange patch; standards oblanceolate, as long as falls; pedicels equalling or exceeding the spathes. S. France, Spain, Portugal, N. Afr.

IRONBARK: *Eucalyptus.*

IRON-TREE: see *Metrosideros.*

IRONWEED: *Vernonia.*

IRONWOOD: *Ostrya virginiana.* **Catalina**: *Lyonothamnus floribundus.* Desert: *Olneya Tesota.*

IRREGULAR FLOWER: some parts different in shape or size from other parts in the same series.

ISATIS. WOAD. *Cruciferæ.* Ann., bien. and per. herbs of the Medit. region and eastward, two of which are more or less cult. for ornament and interest: erect and branching, glabrous to tomentose, with undivided often clasping lvs.: fls. small, yellow or yellowish, in bractless often panicled racemes in late spring and early summer: fr. an indehiscent flat pendulous pod or silique.

glauca. Per. to 4 ft. (perhaps sometimes bien.), glabrous, glaucous: lvs. long-oblong, to 10 in. long, obtuse and entire, tapering to petiole, not clasping on st.: fls. mustard-yellow, in very large terminal panicle. Asia Minor, Persia.—Sometimes planted for ornament; raised from seeds sown the year before blooming.

tinctoria. DYERS W. Bien. to 3 ft., glabrous above: lvs. oblong to lanceolate, to 4 in. long, entire or toothed, those on st. clasping or auricled: fls. yellow, in terminal panicles. Eu., S. W. Asia.— Formerly grown for its blue dye.

ISERTIA. *Rubiaceæ.* Shrubs or trees native from S. Amer. and Trinidad, having large leathery lvs., tubular red, rarely yellow or white, fls. in many-fld. panicles, and fr. a berry.

parviflora. Shrub or small tree: lvs. oblong, to 1 ft. long: fls. light red, about ¼ in. long. Trinidad.

ISLAY: *Prunus ilicifolia.*

ISMELIA: *Chrysanthemum Broussonetii.*

ISMENE: *Hymenocallis calathina.*

ISNARDIA: see *Ludvigia Mulerttii.*

ISOLEPIS: *Scirpus cernuus.*

ISOLOMA. *Gesneriaceæ.* Trop. American herbs with creeping roots, opposite lvs., scarlet or orange fls. with ventricose tube and 5-lobed limb, and capsular frs.; grown in the greenhouse and much hybridized. Propagated by seeds.

amabile. To 2 ft., hairy: lvs. ovate, tapering to petiole, spotted and veined with purple: fls. dark rose dotted with purple, to 2 in. long, drooping. Colombia.

bogotense (*I. Tydæa*). To 2 ft., hairy: lvs. ovate, cordate at base, spotted and veined with pale or silvery-green: fls. red, yellow spotted with red below, nodding. Colombia.

hirsutum. To 4 ft., hairy: lvs. oblong-ovate, rounded at base and petioled: fls. purple with spotted limb, to 1 in. long, nodding. W. Indies.

hondense. To 1 ft., hairy: lvs. ovate: fls. yellow, the tube with bright red hairs, 1 in. or more long. Colombia.

Tydæa: *I. bogotense.*

ISONANDRA: *Palaquium Gutta.*

ISOPLEXIS. *Scrophulariaceæ.* Subshrubs with alternate lvs. and dense terminal racemes of yellow tubular fls., differing from Digitalis chiefly in the upper lip of corolla as long as lower lip; grown in the open in Calif.; two species from Canary Isls. Cult. and propagation as for the shrubby forms of *Digitalis.*

canariensis (*Digitalis canariensis*). Stiff, to 4 ft.: lvs. shining, thick, lanceolate, to 6 in. long, sharp-toothed: fls. yellow-brown, 1 in. long, strongly 2-lipped, in racemes to 1 ft. long.—The plant sometimes grown in the East as *Digitalis canariensis* is *D. ambigua.*

Sceptrum. Differs from *I. canariensis* in the larger lvs., fls. drooping and not bilabiate, the lobes obtuse and half length of tube.

ISOPOGON. *Proteaceæ.* Australian shrubs with stiff rigid lvs., bisexual fls. in dense cone-like spikes, each fl. sessile in a bract or scale, and small nut-like frs.; grown somewhat in S. Calif. Cult. as for *Hakea.*

anemonifolius. To 6 ft.: lvs. to 4 in. long, 2–3-pinnate into linear flat entire or lobed segms.: fls. yellow, in nearly globose cones to ¾ in. across. New S. Wales.

anethifolius. To 4 ft.: lvs. 1–2-pinnate into needle-like terete segms.: fls. yellow, in globular cones to 1 in. across. New S. Wales.

roseus. To 4 ft.: lvs. to 3 in. long, 1–2 ternately divided into linear or lobed segms.: fls. pink, in globular cones to 1 in. across. W. Australia.

sphærocephalus. Lvs. linear, to 4 in. long, sessile: fls. yellow-hairy, in globular cones to ¾ in. across. W. Australia.

ISOPYRUM. *Ranunculaceæ.* Little delicate per. herbs with basal decompound lvs. and white fls. solitary or in panicles having 5–6 petal-like sepals, small petals or none, and numerous stamens; native in north temp. zone and sometimes transferred to the wild-garden or colonized. Propagated by seeds or division of roots.

biternatum. Lvs. biternate, long-stalked: fls. to ¾ in. across, in clusters in spring. Ont. to Fla. and Tex.

fumarioides: *Leptopyrum fumarioides.*

ISOTOMA. *Lobeliaceæ.* Ann. or per. herbs with alternate simple or pinnatifid lvs. and blue, purple or white fls., differing from Lobelia in the entire corolla-tube and the stamens inserted near top of corolla.

petræa. Per. to 1 ft., but blooming the first year: lvs. ovate-oblong, with linear irregular teeth: fls. bluish-purple, to 1 in. long and limb spreading to 1 in., on long axillary stalks. Australia. Var. alba is listed.

ITEA. *Saxifragaceæ.* Trees and shrubs, sometimes evergreen, with alternate simple narrow lvs. and small numerous white fls. in terminal or axillary racemes; about 10 species, 1 in E. U. S. and the others in trop. and temp. Asia.

The native itea is hardy as far north as Boston. It grows well in almost any soil and in both sun and shade. In autumn the foliage becomes a brilliant red. Propagated by cuttings and by division of the roots, which spread slowly and form clumps of stems; also by seed when obtainable.

ilicifolia. Evergreen shrub to 10 ft.: lvs. to 4 in. long, spiny-toothed and holly-like: fls. greenish-white, in drooping racemes to 1 ft. long. China.—To be grown under glass N.

virginica. SWEET SPIRE. Deciduous shrub to 10 ft.: lvs. to 4 in. long, finely toothed: fls. white, fragrant, in upright racemes to 6 in. long. N. J. to Fla. and La.

yunnanensis. Evergreen shrub: lvs. ovate, to 4 in. long, toothed or rarely nearly entire, glaucescent: fls. in racemes to 6 in. long. Yunnan.

IVY: *Hedera.* **American:** *Parthenocissus quinquefolia.* **Boston:** *Parthenocissus tricuspidata.* **Five-leaved:** *Parthenocissus quinquefolia.* **German:** *Senecio mikanioides.* **Ground:** *Nepeta hederacea.* **Japanese:** *Parthenocissus tricuspidata.* **Kenilworth:** *Cymbalaria muralis.* **Marine:** *Cissus incisa.*

IXIA (*Hyalis*). *Iridaceæ.* S. African cormous herbs with grass-like lvs. mostly at base of st. and fls. of many colors in terminal spikes or racemes, the perianth-tube long or short.

Ixias may be planted out-of-doors in late November in some parts of the country, but should be well protected by mulch. Bulbs should be set about 2 to 3 inches deep in the open with a little sand sprinkled under them. They may also be planted in spring for summer bloom. After flowering the bulbs should remain in the ground until July when they are lifted and stored in boxes without packing. In the North, ixias are usually grown under glass for winter and early spring bloom. They should be retarded at first and then kept in a temperature of about 55° until after flowering. The corms may be planted in September or October, 5 or 6 of them in a 6-inch pot, about 1 inch deep. They are not hardy in the northern states.

aurantiaca: *I. lutea.*

columellaris. To 2 ft.: fls. lilac- or mauve-purple, segms. 1 in. long, throat blue.

crateroides: *I. speciosa.*

lutea (*I. aurantiaca*). To 2 ft.: fls. deep yellow.

maculata. To 2 ft.: fls. yellow but in cult. varying to white and tinged with red or purple, segms. 1 in. long, throat with large dark spot.

speciosa (*I. crateroides*). To 1 ft.: fls. dark crimson.

viridiflora. To 2 ft.: fls. pale green, throat black.

IXIOLIRION. *Amaryllidaceæ.* Asian bulbous herbs with very narrow mostly basal lvs. and blue or violet fls. in umbels, the perianth-segms. distinct. The bulbs would better be stored over winter. The genus was formerly associated doubtfully with *Liliaceæ.*

montanum (*I. tataricum*). To 1 ft.: basal lvs. 4, persistent: fls. lilac, 1½ in. long, in 4–6-fld. umbels. Siberia to W. Asia.

tataricum: *I. montanum.*

IXORA. *Rubiaceæ.* Trop. evergreen shrubs or trees with opposite or whorled lvs., white to red fls. in compact corymbs, the corolla long-tubular with spreading 4–5-lobed limb, and fr. a berry. It is not certain how many species and forms may be cult. in the U. S.

Ixoras are grown in the greenhouse, and in the open in warm climates as Florida and Gulf Coast. They should have a night temperature of about 65°. Propagated by cuttings, preferably with three or four joints, in spring and kept over bottom heat; also by seeds when produced. See *Hamelia erecta.*

acuminata. Shrub: lvs. variable, oval to linear-oblong, to 9 in. or more long, leathery: fls. white, fragrant, ⅔ in. across, lobes rounded, in corymbs to 4 in. across. India.

amabilis: hort. name for a form with pinkish fls. suffused with orange.

amboinica. Shrub: lvs. ovate-oblong, undulate: fls. orange-yellow, the lobes acute, in branched cymes. Moluccas.

aurantiaca: hort. form with orange-red fls.

barbata. Large shrub: lvs. elliptic, more or less acute, to 8 in. long and nearly half as broad: fls. white, in short-stalked large cymes that are broader than high, to 12 in. across. India.

Chelsoni: garden form having brilliant salmon-orange fls.

chinensis. Shrub: lvs. obovate, to 4 in. long: fls. red varying to white, 1 in. long, lobes rounded, in dense corymbs. Malaya, China.

coccinea (*I. incarnata*). Shrub: lvs. oblong, to 4 in. long: fls. red, to 1¾ in. long, the lobes acute, in dense corymbs. E. Indies.

Colei: hort. var. with pure white fls.

congesta. Tree: lvs. oval, to 1 ft. long, leathery: fls. orange-yellow becoming reddish, lobes rounded, in nearly sessile cymes. India.

Dixiana: hort. form with deep orange fls.

Duffii: *I. macrothyrsa.*

Finlaysoniana: see *I. Thwaitesii.*

flore-luteo: hort. name for a yellow-fld. kind.

fulgens. Shrub: lvs. narrow-oblong, to 8 in. long, shining above: fls. orange-scarlet, to 1¾ in. long, the lobes acute, in large sessile cymes. India, E. Indies.

incarnata: *I. coccinea.*

javanica. Shrub: lvs. ovate-oblong, to 7 in. long: fls. orange-red, 1½ in. long, lobes rounded, in corymbs with coral-red branches. Java.

laxiflora. Slender shrub to 4 ft.: lvs. oblong-lanceolate and acuminate: fls. white tinged pink, with tube 1½ in. long, fragrant, in large 3-forked panicles. Guinea.

lutea. Garden plant similar to *I. coccinea* and apparently a form of it, but with pale yellow fls. and larger lobes; more than one thing may be grown under this name.

macrothyrsa (*I. Duffii*). Large shrub: lvs. linear-oblong, to 1 ft. long: fls. deep red, 1 in. across, lobes obtuse, in many-fld. corymbs to 8 in. across. E. Indies.

odorata. Small shrub: lvs. ovate to somewhat obovate, acute or acuminate, firm, sometimes 12 in. long: fls. white changing to brownish, very fragrant, corolla to 4 or 5 in. long, in large purple-branched clusters. Madagascar.

parviflora. Tree: lvs. oblong or oval, to 6 in. long: fls. white, fragrant, ⅓ in. long, in clusters in cymes to 6 in. across. India.

roseo-splendens: hort. name.

Thwaitesii. Large shrub or somewhat tree-like: lvs. somewhat coriaceous, oblong to broadly oblanceolate, to 5 in., more or less undulate but entire: fls. to 1½ in. long, very slender, white, fragrant. Ceylon.—The plant known as *I. Finlaysoniana* is probably the same.

Westii: hort. form with pale or brilliant rose fls.

Williamsii: hort. name for a var. with reddish-salmon fls.

J

JABOTICABA: *Eugenia cauliflora.*

JACARANDA. *Bignoniaceæ.* Trop. American trees and shrubs with opposite usually 2-pinnate lvs., funnelform 5-lobed blue or violet fls. in panicles, and capsular broad frs.; grown in subtrop. regions or under glass in the N. Propagated by cuttings of half-ripened wood when seeds are not available.

acutifolia (*J. mimosifolia. J. ovalifolia*). To 50 ft. or more: lvs. fern-like, pubescent, the ultimate segms. about ⅓ in. long: fls. blue, 2 in. long and 1½ in. across. Brazil.

cuspidifolia. To 30 ft.: lvs. to 2 ft. long, glabrous, the ultimate segms. about 1 in. long: fls. blue-violet, 1½ in. long and very long-pointed. Brazil, Argentina.

mimosifolia: *J. acutifolia.*

ovalifolia: *J. acutifolia.*

JACKFRUIT: *Artocarpus integra.*

JACK-IN-THE-PULPIT: *Arisæma triphyllum.*

JACOBÆA: *Senecio.*

JACOBINIA. *Acanthaceæ.* Trop. American rather showy herbs and shrubs with opposite entire lvs. and red, orange or yellow, tubular 2-lipped fls.

Jacobinias are grown in greenhouses and in the open in warm regions. They are of easy cultivation but likely to become weedy unless properly restrained and cared for. Propagated by cuttings as well as by seeds.

aurea: *J. umbrosa.*

carnea (*Justicia magnifica* and *carnea*). To 5 ft.: lvs. ovate or oblong, to 7 in. long: fls. rose-purple or pink, 2 in. long, in dense terminal heads 4 in. long, with acuminate bracts ¾ in. long. Brazil.—Most of the plants grown under this name are *J. obtusior.*

coccinea: *Pachystachys coccinea.*

Ghiesbreghtiana (*Justicia Ghiesbreghtiana*). To 5 ft.: lvs. lanceolate-ovate, to 6 in. long: fls. orange or crimson, 1½ in. long, in loose panicles, with small bracts. Mex.

Mohintli: *J. spicigera.*

obtusior. Lvs. lanceolate or ovate-lanceolate: fls. pink to crimson, in short dense terminal infl., the bracts very obtuse. Brazil.

pauciflora (*Libonia floribunda. Sericographis pauciflora*). To 2 ft.: lvs. oblong or oval, about ¾ in long: fls. scarlet deeply tipped with yellow, ¾ in. long, solitary and nodding. Brazil.

penrhoziensis. Hybrid between *J. pauciflora* and *J. Ghiesbreghtiana:* fls. carmine slightly tipped with yellow, 1¼ in. long.

Pohliana. To 5 ft. or more: lvs. ovate, often purplish: fls. bright crimson, in spikes, the bracts acute. Brazil.

spicigera (*J. Mohintli. Justicia spicigera* and *Mohintli*). To 5 ft.: lvs. lanceolate-oblong to ovate, to 7 in. long: fls. red or orange, 1½ in. long, in few-fld. cymes. Mex.

umbrosa (*J. aurea*). To 12 ft.: lvs. lanceolate-oblong to ovate, to 1 ft. long: fls. yellow, 2 in. long, in dense terminal infl. to 1 ft. long, with acute bracts. Mex., Cent. Amer.

velutina. Similar to *J. obtusior* but lvs. pubescent on both sides. Brazil.

JACOBS-LADDER: *Polemonium cæruleum.* **-Rod:** *Asphodeline.* **-Staff:** *Fouquieria splendens.*

JACQUEMONTIA. *Convolvulaceæ.* Trop. American herbaceous twining vines with usually entire lvs. and blue or white bell-shaped fls. in cymes or panicles; differs from Ipomœa in the 2 flattened stigmas, fls. usually smaller and in closer clusters. Cult. as for *Ipomœa;* sometimes planted S.

Eastwoodiana. Small bush or trailing, densely tomentose: lvs. cordate-ovate, to 1 in. long: fls. bright blue, ⅗ in. across, on peduncles longer than lvs. Isls., Gulf of Calif.

montana (*Ipomœa montana*). Plant densely tomentose: lvs. ovate, to 3 in. long, entire or 3-lobed and toothed: fls. yellow, ½ in. across, in dense cymes on peduncles much longer than lvs. Brazil.

pentantha (*J. violacea*). Lvs. cordate-ovate, to 2 in. long: fls. blue, 1 in. across, the cymes on peduncles as long as or longer than the lvs. Fla. to S. Amer.

violacea: *J. pentantha.*

JAJOBA: *Simmondsia californica.*

JAKFRUIT: *Artocarpus integra.*

JAMBOS, JAMBOSA: *Eugenia.*

JAMESIA (*Edwinia*). *Saxifragaceæ.* Deciduous shrubs native in W. N. Amer., with opposite toothed lvs. and fls. in terminal cymes.

One species is planted, hardy North; it succeeds in sunny positions in well-drained soil. Propagated by seeds and cuttings of ripe wood.

americana. To 3 ft. or more: lvs. ovate, to 2½ in. long, gray- or white-tomentose beneath: fls. white or in var. rosea pink, about ½ in. across, May–June. Wyo. to New Mex.

JAMESTOWN-WEED: *Datura Stramonium.*

JARRAH: *Eucalyptus marginata.*

JASIONE. *Campanulaceæ.* Ann. and per. European herbs with alternate simple lvs., blue or white 5-parted fls. in heads subtended by an involucre, and many-seeded capsular frs.; useful in the rock-garden and for borders. Propagated by seed and division.

humilis. Per. to 9 in., hairy: lvs. linear-obovate, entire: fls. blue, in short-stalked heads ½ in. across. Pyrenees.

montana. Ann. or bien. to 1 ft.: lvs. linear or lanceolate, wavy: fls. pale blue, in long-stalked heads to 1 in. across. Eu.

perennis. SHEPHERDS-SCABIOUS. SHEEPS-BIT. Per. to 1 ft.: lvs. obovate to oblong-linear, entire: fls. blue, in long-stalked globose heads to 2 in. across. S. Eu.

JASMINE: *Jasminum.* **Cape-:** *Gardenia jasminoides.* **Chilean-:** *Mandevilla suaveolens.* **Confederate-:** *Trachelospermum jasminoides.* **Crape-:** *Ervatamia coronaria.* **Madagascar-:** *Stephanotis floribunda.* **Night-:** *Nyctanthes Arbor-tristis.* **Rock-:** *Androsace.* **Star-:** *Trachelospermum jasminoides.*

JASMINUM. JASMINE. JESSAMINE. *Oleaceæ.* Trop and semi-trop. mostly Old World shrubs, often clambering climbers, with pinnate opposite or alternate lvs. or reduced to 1 lft., white, yellow or pink salverform fls. having slender tube and 4–9 corolla-lobes, and fr. a more or less 2-lobed mostly black berry; some of them are evergreen, often very fragrant. They are essentially plants of warm or mild climates; none is hardy in the open in the northern states although *J. humile, J. nudiflorum* and *J. officinale* stand near the coast in central parts.

Jasmines are grown out-of-doors in warm regions and as greenhouse plants elsewhere. They are of easy cultivation. Propagated by cuttings of nearly ripe wood in summer, of ripe wood in autumn, by layers, and sometimes by seeds.

azoricum. Climbing, evergreen: lvs. opposite, of 3 broad-ovate lfts. to 3 in. long, and obtuse or nearly so, the terminal one long-stalked: fls. white, 1 in. across, in many-fld. rather open cymes; teeth of calyx very short. Canary Isls.

bahiense. Much like *J. azoricum*, of which it is considered a var. by some authors, but lfts. ovate or narrower, acuminate, prominently pointed. Brazil, and planted in Cuba.—To be expected in S. Fla.

Beesianum. To 3 ft. or more, somewhat clambering: lvs. opposite, simple, lanceolate or ovate-lanceolate, to 2 in. long, sharp-pointed: fls. pink or rose, fragrant, to ¾ in. across, in 1–3-fld. cymes; teeth of calyx ¼ in. long. China.

calcareum: name erroneously applied to a white- or yellow-fld. climbing simple-lvd. shrub cult. in Calif., the identity of which is yet not determined.

Carroldii: *J. Giraldii* is meant.

dichotomum. GOLD COAST J. Climbing or clambering evergreen, blooming continuously: lvs. in 2's or 3's, thick and glossy, oblong, pointed, to 3 in. long: fls. white, fragrant, more than 1 in. long, opening at night. W. Afr.; promising in S. Fla.

floridum. Erect, half-evergreen: lvs. alternate, of 3 or rarely 5 oval to ovate-oblong lfts. to 1½ in. long: fls. yellow, ½ in. across, in many-fld. cymes; teeth of calyx as long as tube. China.

fruticans. To 9 ft. or more, not climbing, evergreen or partially so, the branches weak: lvs. alternate, of 3 oblong obtuse lfts. to ¾ in. long: fls. yellow, in 2–5-fld. cymes; teeth of calyx long as tube. S. Eu., N. Afr.

Giraldii. To 6 ft., erect, deciduous: lvs. alternate, of 3 or rarely 5 ovate or oblong-ovate lfts. to 1½ in. long, obtuse or acute: fls. yellow, ½ in. across, in 3–9-fld. cymes; teeth of calyx about length of tube. China.

gracillimum. Climbing, pubescent: lvs. opposite, simple, ovate-lanceolate, to 1½ in. long: fls. white, fragrant, 1 in. or more across, in many-fld. cymes; teeth of calyx to ½ in. long. N. Borneo.

grandiflorum. SPANISH J. Nearly erect or with weak vine-like branches: lvs. opposite, of 5–7 oval lfts., the lateral ones about ½ in. long, terminal one longer and acuminate: fls. white often tinged with pink outside, to 1½ in. across, fragrant, in clusters; teeth of calyx ¼ in. long. India; nat. in Fla.

heterophyllum. Climbing: lvs. alternate, simple or with 3 ovate-lanceolate lfts. to 5 in. long: fls. yellow, in compound cymes; calyx-teeth minute. India.

humile (*J. revolutum. J. Reevesii. J. triumphans. J. Wallichianum*). To 20 ft., erect and sometimes almost tree-like, evergreen, with weak branches: lvs. alternate, of 3–7 ovate to lanceolate lfts. to 2 in. long: fls. yellow, to 1 in. across, fragrant, in clusters; teeth of calyx very short. Trop. Asia.—One of the commonest and hardiest in cult.

ligustrifolium: *J. rigidum.*

nitidum. Partly climbing: lvs. opposite, simple, oval-lanceolate, to 3 in. long: fls. white, 1½ in. across, fragrant; teeth of calyx short. S. Pacific.

nudiflorum. To 15 ft., diffuse but not climbing, deciduous, the branchlets 4-angled: lvs. opposite, of 3 oblong or ovate lfts. to 1 in. long: fls. yellow, 1 in. across, solitary, before the lvs.; teeth of calyx leafy, as long as tube. China.—Showy shrub in early spring.

officinale. JESSAMINE. To 30 ft., climbing or with weak sts.: lvs. opposite, of 5–7 ovate lfts. to 2½ in. long, the terminal lft. larger: fls. white, ¾ in. across, fragrant, in clusters; teeth of calyx to ½ in. long. Persia. Var. **aureo-variegatum** has variegated lvs.

Parkeri. To 1 ft.: lvs. alternate, of 3–5 ovate lfts. to ¼ in. long: fls. yellow, ½ in. across, solitary; teeth of calyx half as long as tube. Himalayas.

primulinum. To 10 ft., not climbing, evergreen, the long branchlets 4-angled: lvs. opposite, of 3 oblong to lanceolate lfts. to 3 in. long: fls. yellow with darker center, often double, to 2 in. across, solitary, the corolla-tube short; teeth of calyx leafy, longer than tube. China.—Showy, and sometimes grown under glass.

pubescens. Climbing evergreen, pubescent: lvs. opposite, simple, ovate and acuminate, to 2 in. long: fls. white, often double, 1 in. across, in dense clusters; teeth of calyx ½ in. long, yellow hairy-pubescent; cool season. India.

Reevesii: *J. humile.*

revolutum: *J. humile.*

rigidum (*J. ligustrifolium*). Stiff shrub: lvs. opposite, simple, ovate, to 2 in. long, leathery: fls. white, fragrant, in few-fld. cymes, teeth of calyx linear. India.

Sambac. ARABIAN J. To 5 ft., climbing, the sts. pubescent: lvs. opposite or perhaps sometimes in 3's, simple, broad-ovate, to 3 in. long: fls. white, to 1 in. across, fragrant, in clusters, often full double; teeth of calyx ¼ in. long. India.

simplicifolium. To 30 ft., climbing: lvs. opposite, simple, ovate, to 2½ in. long: fls. white, ¾ in. across, fragrant, in branched cymes; teeth of calyx very short. Australia; nat. in Bermuda.

trinerve. Climbing: lvs. opposite, simple, ovate-oblong, 3-nerved from base: fls. white, in clusters; teeth of calyx longer than tube. India.

triumphans: *J. humile.*

undulatum. Climbing: lvs. opposite, simple, lance-ovate, acuminate, to 3 in. long: fls. white, fragrant, in cymes; teeth of calyx much longer than tube. India.

Wallichianum: *J. humile.*

JATROPHA. *Euphorbiaceæ.* Mostly trop. herbs, shrubs or trees with milky juice, alternate palmately lobed or cut lvs. and unisexual fls. with or without petals; a few of them are listed for sale. Propagated by seeds and cuttings. They often bear stinging hairs.

Curcas (*Curcas Curcas*). BARBADOS-NUT. PHYSIC-NUT. Tree to 15 ft.: lvs. roundish, to 6 in. across, slightly 3–5-lobed, long-stalked: fls. yellow, in cymes, with petals. Trop. Amer.

hastata (*Adenoropium hastatum*). PEREGRINA. Shrub to 5 ft., glabrous or close-pubescent: lvs. oblong-obovate and constricted below into a fiddle-shape, sharp-acuminate: fls. scarlet or rose, to 1 in. across, in terminal cymes. Cuba.

Manihot: *Manihot esculenta.*

multifida (*Adenoropium multifidum*). CORAL-PLANT. Shrub or tree to 20 ft.: lvs. nearly orbicular, to 1 ft. across, deeply parted into entire or cut lobes, glaucous beneath: fls. scarlet, with petals, in compound cymes. Trop. Amer.

podagrica. TARTOGO. Trunk short and swollen and gouty, to about 1½ ft., with bristled scars: lvs. orbicular-ovate in outline, peltate, long-stalked, to 10 in. across, deeply 3–5-lobed with obtuse sinuses: fls. small, coral-red, in terminal long-peduncled cymes with red pedicels. Cent. Amer.—Planted in warm countries and sometimes seen under glass.

texana (*Cnidoscolus texanus*). To 2 ft., covered with stiff bristly hairs: lvs. to 6 in. across, deeply 3–5-lobed into toothed or cut lobes, on long stalks: fls. white, without petals, in clusters. Ark. to Tex.

JEFFERSONIA. *Berberidaceæ.* Two per. herbs native in E. N. Amer. and in Asia, the former transferred from the woods: lvs. basal, palmately veined or lobed: fls. white, solitary at tip of slender scape: fr. a leathery caps.

diphylla. TWIN-LEAF. To 1 ft.: lvs. 2-parted into kidney-shaped entire or lobed divisions, glaucous beneath: fls. 1 in. across, May. Ont. to Va. and Tenn.

JERUSALEM CROSS: *Lychnis chalcedonica.*

JESSAMINE: *Jasminum, Cestrum.* **Carolina Yellow:** *Gelsemium sempervirens.* **Orange-:** *Murræa.*

JETBEAD: *Rhodotypos tetrapetala.*

JEW-BUSH: *Pedilanthus tithymaloides.*

JEWEL VINE, MALAY: *Derris scandens.*

JIMSON-WEED: *Datura Stramonium.*

JOBS-TEARS: *Coix Lacryma-Jobi.*

JOE-PYE WEED: *Eupatorium maculatum, purpureum* and *verticillatum.*

JOINTED: with nodes, or points of real or apparent articulation.

JOINT-FIR: *Ephedra.*

JOINTWOOD: *Cassia nodosa.*

JONQUIL: *Narcissus.*

JOSEPHS-COAT: see *Amaranthus tricolor.*

JOSHUA-TREE: *Yucca brevifolia.*

JOVELLANA. *Scrophulariaceæ.* Herbs or small shrubs from Chile and New Zeal., allied to Calceolaria and differing in the 2 lobes of the corolla being nearly equal in size.

Sinclairii. To 1½ ft., glandular-pubescent: lvs. opposite, ovate, to 3 in. long, coarsely toothed or lobed: fls. white or yellow spotted with purple, ¼ in. across, in terminal panicles. New Zeal.

violacea (*Calceolaria violacea*). To 1½ ft., the st. white-hairy: lvs. ovate, to 1 in. long, coarsely toothed or sometimes lobed: fls. yellowish-white spotted with purple, ½ in. across, in terminal panicles. Chile.

JUANIA. *Palmaceæ.* One monœcious unarmed graceful feather-palm of isl. Juan Fernandez (Chile), which has been intro. into S. Calif.: spadices among the lvs., about 1 ft. long, simply branched, the sexes in different inflorescences; stamens 6: fr. size of cherry, with the stigmatic point terminal rather than basal and in that respect differing from Ceroxylon. **J. australis.** Tree of medium stature: lvs. 4–6 ft. long; pinnæ many, 2–3 together, linear and acuminate, bifid at apex into slender points, scaly or lepidote underneath, with about 2 secondary nerves either side midrib, margins somewhat thickened; peduncle more than 1 ft. long.

JUBÆA. *Palmaceæ.* One massive unarmed monœcious feather-palm of Chile, frequently planted in S. Calif., also sometimes grown under glass in the juvenile state and in tubs for planting out in subtrop. clumps; does not thrive in Fla. **J. chilensis** (*J. spectabilis*). Syrup Palm. Trunk columnar even when the tree is low, 4–6 ft. diam., bearing scars of the expanded fallen lf.-bases, carrying a thick crown of erect-spreading foliage; height to 80 ft. or more: petioles relatively short, margined with stiff hair-like filaments but not truly spiny; lvs. green, 6–12 ft. long; pinnæ numerous, 2 ft. or more long and about 1 in. broad, conduplicate, bifid at tip: spadices from lower lf.-axils, the large spathes hanging long; staminate fls. on upper part of branches, stamens 15–30: fr. globose-ovoid, 1½ in. long, yellow, 1-seeded, drupe-like with fibrous flesh.—In Chile sugar or "honey" is made from the sap, and the nuts are employed in confectionary.

JUDAS-TREE: *Cercis.*

JUGLANDACEÆ. Walnut Family. Six woody monœcious genera in the north temp. zone, having alternate pinnate lvs., staminate fls. in hanging catkins with 3-many stamens and with or without perianth, pistillate fls. with 3–5-lobed calyx and inferior ovary and borne a few together or in racemes, and fr. a nut, winged nutlet, or drupe. Carya, Juglans, Platycarya and Pterocarya are grown for ornament, shade, and for the edible nuts; many of the species are timber trees.

JUGLANS. Walnut. *Juglandaceæ.* Deciduous monœcious trees with large odd-pinnate lvs., staminate fls. in drooping catkins from last-year wood, pisillate fls. on wood of current year, and fr. a furrowed nut inclosed in a thick indehiscent husk; grown for ornament, the edible nuts, and for timber used in building and making of furniture. Propagated by stratified seeds and special varieties by grafting and budding. For cult. see *Walnut.*

ailanthifolia: *J. Sieboldiana.*

californica. California W. Shrub or tree to 60 ft.: lvs. of 9–17 ovate-lanceolate lfts. to 3 in. long: fr. globose, ¾ in. across, pubescent. S. Calif.

cathayensis. Chinese W. To 80 ft.: lvs. of 9–17 ovate-oblong lfts. to 6 in. or more long, pubescent beneath: fr. ovoid, to 2 in. long, pointed, sticky-pubescent. China.

cinerea. Butternut. To 100 ft.: lvs. of 11–19 pubescent lfts. to 5 in. long: fr. ovoid-oblong, to 4 in. long, sticky-pubescent. N. B. to Ark.

cordiformis: *J. Sieboldiana* var.

Hindsii. To 75 ft.: lvs. of 15–19 ovate-lanceolate or lanceolate lfts. to 4 in. long: fr. nearly globose, to 2 in. across, pubescent, the nuts nearly smooth. Cent. Calif.

japonica. A name erroneously applied in the trade to forms of *J. Sieboldiana* or *J. regia.*

major. To 60 ft.: lvs. of 9–13 or more narrow-ovate to oblong-lanceolate lfts. pubescent on rib and rachis underneath: fr. nearly globose, 1 in. or more long, nut deeply grooved. Colo. to Ariz.

mandshurica. To 60 ft.: lvs. of 9–17 oblong lfts. to 8 in. long: fr. ovate to oblong, 2 in. long, sticky-pubescent. Manchuria.

nigra. Black W. To 150 ft.: lvs. of 15–23 ovate-oblong lfts. to 5 in. long, pubescent beneath: fr. globose, to 2 in. across, pubescent. Mass. to Fla. and Tex.

regia. Persian or English W. To 100 ft., with silvery-gray bark: lvs. of usually 7–9 oblong lfts. to 5 in. long: fr. nearly globose, to 2 in. across, glabrous. S. E. Eu., Asia. Var. **laciniata,** lfts. pinnately cut. Var. **maxima** (var. *macrocarpa*), nuts much larger. Var. **monophylla,** lvs. simple or with 3 lfts. Var. **pendula,** branches drooping. Var. **præparturiens,** shrubby earlier-maturing form.

rupestris. Rarely to 30 ft.: lvs. of 15–23 lanceolate lfts. to 3 in. long: fr. globose, ¾ in. across, nearly glabrous. Tex., New Mex.

Sieboldiana (*J. ailanthifolia*). To 60 ft.: lvs. of 11–17 oval lfts. to 6 in. long, pubescent beneath: fr. globose, about 2 in. long, pointed, sticky-pubescent. Japan. Var. **cordiformis** (*J. cordiformis*) has heart-shaped flattened sharply 2-edged lvs.

JUJUBE: *Zizyphus.*

JUNCACEÆ. Rush Family. Grass-like herbs of 8 widely distributed genera, with inconspicuous, greenish, chaff-like bisexual fls. borne in heads, panicles or corymbs, having 3 sepals and 3 petals, 3 or 6 stamens, superior 1- or 3-celled ovary, and capsular frs. Only Juncus is occasionally planted.

JUNCUS. Rush. *Juncaceæ.* Glabrous stiffish herbs, the following per., with lvs. reduced to basal sheaths; rarely transplanted for ground-cover or interest, and the forms of *J. effusus* sometimes grown in pots. Propagated by seeds and division. Most of the species are plants of low ground.

balticus. Tufted, to 3½ ft.: fls. greenish, ⅙ in. long, the segms. with white margins. Eu., N. Amer.

effusus. Tufted, to 4 ft.: fls. pale brown, 1/12 in. long. N. Amer., Eu., Asia. Var. **spiralis** has spirally twisted sts. and var. **vittatus** yellow-striped herbage.

Lescurii. To 3 ft.: fls. dark brown, ¼ in. long, the segms. with deep purple margins. Alaska to Calif.

JUNEBERRY. Some of the species of Amelanchier yield attractive edible berry-like small fruits. The ones grown sometimes in gardens for the fruit are dwarf bushes. The variety Success (*Amelanchier stolonifera*), which is best known, is a hardy bush 2–3 feet high, suckering at the base and by that means it is propagated. It may be grown much like currants and gooseberries. A row at one side of the garden will soon make a good border, showy with its racemes of white flowers in May (in central New York) while the leaves are small, and laden in July with red-purple blueberry-like fruits about ½ inch in diameter. Juneberries are of simple cultural requirements.

JUNIPERUS. Juniper. *Pinaceæ.* Evergreen mostly small trees and shrubs widely dispersed in the northern hemisphere, some of them arctic, having needle- or scale-like lvs., commonly appressed on old branchlets and spreading on new growth, yellow staminate fls. in little catkins, and fr. a berry-like body formed of the coalescence of the fleshy scales of the cone. Many species are grown for ornament and some of them supply useful timber; some, as *J. virginiana*, are known as cedars. For cult. see *Conifers.*

arizonica: possibly *Cupressus arizonica.*

barbadensis: *J. bermudiana* or sometimes erroneously *J. lucyana.*

bermudiana (*J. barbadensis*). Tree to 40 ft.: lvs. mostly overlapping, spiny-pointed, pale bluish-green: fr. blue, bloomy. Bermuda, Barbados, Antigua; to be planted only far S.

californica (*Sabina californica*). Shrub to 12 ft. or rarely tree: lvs. overlapping, scale-like: fr. reddish-brown. Calif.—The name var. *glauca* is listed.

Cedrus. Tree to 12 ft., with drooping branchlets: lvs. spreading, linear: fr. orange-brown. Canary Isls.

chinensis. Tree to 60 ft. and more or sometimes shrubby: lvs. of 2 kinds, scale-like or linear and spreading with 2 white bands below: fr. brown, bloomy. E. Asia; hardy in Cent. N. Y. and New England. There are numerous hort. vars. of high ornamental value, as: **aurea**, young growth golden-yellow; **aureo-globosa**, dwarf globose form with young growth golden-yellow; **fœmina**, a form with female fls. and fr.; **globosa** (*J. virginalis globosa*) of dwarf globose habit; **japonica** (var. *procumbens, J. japonica*), low shrub with decumbent branches, and its forms **alba** (var. *procumbens albo-variegata*) with lvs. variegated white, and **aureo-variegata** variegated with yellow; **mas** (var. *mascula*, var. *neaboriensis*), conical form with male fls.; **pendula**, branches drooping at tips; **Pfitzeriana**, of pyramidal habit with nodding branchlets, grayish-green; **plumosa**, low, with arching branches and branchlets forming plumose sprays and **aurea** (var. *japonica aurea*) with young lvs. golden-yellow; **pyramidalis**, of narrow-pyramidal habit and bluish-green lvs.; **Sargentii**, prostrate shrub with creeping sts.; **Sheppardi**, juvenile form of bushy drooping habit; **torulosa**, a form with twisted branchlets; **variegata** (var. *albo-variegata*), tips of branchlets creamy-white.—Other listed names are *columnaris, dentata, monumentalis, stricta, viridis.*

communis. Common J. Shrub or tree to 40 ft.: lvs. linear, spreading, sharp-pointed, with broad white band above: fr. dark blue, bloomy. Widely distributed in N. Amer. (E. Mass. south and west), Eu., Asia. Varieties are: **aurea**, young growth golden-yellow; **compressa**, dwarf shrub with short crowded branchlets; **cracovia**, Polish J., branchlets drooping; **depressa** (var. *canadensis*), shrub to 4 ft. and its form **aureo-spica** with tips of branchlets golden-yellow; **echiniformis**, Hedgehog J., to 2 ft. with densely crowded branchlets; **hemisphærica**, dense rounded shrub to 3 ft.; **hibernica**, Irish J., columnar form with upright dark green branches; **Jackii**, prostrate shrub with trailing branches, Ore., N. Calif.; **montana** (*J. nana*), spreading shrub to 2 ft.; **nipponica**, a Japanese form similar to var. *Jackii;* **oblongo-pendula**, columnar form with drooping branchlets; **pendula**, branchlets drooping; **suecica**, Swedish J., of narrow-columnar habit and branchlets drooping at tips. A form, *Ashfordi*, is also listed.

conferta (*J. litoralis*). Shore J. Procumbent shrub: lvs. linear, spreading, spiny-pointed, bluish-green with white band above: fr. black, bloomy. Japan, Saghalin; hardy in southern New England.

drupacea. Syrian J. Tree to 45 ft., of pyramidal habit: lvs. linear-lanceolate, spreading, spiny-pointed, with 2 white lines above: cones bluish or brown, bloomy. Greece, Asia Minor; to be planted far S.

excelsa. Greek J. Tree to 60 ft., of pyramidal habit: lvs. mostly scale-like, dark or bluish-green: fr. purplish-brown, bloomy. S. W. Eu., Asia Minor; hardy only far S. Var. **stricta** is a columnar form with young lvs. glaucous, more hardy. Var. **variegata** has lvs. variegated with yellowish-white.

flaccida. Tree to 30 ft., with drooping branchlets: lvs. scale-like, acuminate: fr. red-brown, bloomy. Tex., Mex.

formosana (*J. oblonga pendula*). Tree to 40 ft., with drooping branchlets: lvs. linear, spreading, spiny-pointed, with 2 broad white bands above: fr. reddish or orange-brown. Formosa, China; may be planted as far north as N. Y. and New England.

Fortunei: *J. sphærica*, but the material cult. under this name is probably a form of *J. chinensis.*

Gossinthiana: listed name.

horizontalis (*J. prostrata*). Creeping J. or Savin. Procumbent shrub with long trailing branches: lvs. mostly scale-like, overlapping, bluish-green: fr. blue. N. S. west and south.—Once thought to be a form of other species. Var. **alpina** (*J. Sabina* var. *alpina*), sts. nearly upright at first; var. **Douglasii**, Waukegan J., trailing form with steel-blue lvs.; var. **glomerata**, dwarf form with branchlets crowded into dense clusters; var. **plumosa**, depressed shrub with linear lvs.

japonica: *J. chinensis* var.

Kaizuda: listed name.

libretonia: listed name.

litoralis: *J. conferta.*

lucayana. Southern Red-Cedar. Tree to 50 ft., with drooping branchlets: lvs. scale-like, overlapping, light green: fr. dark blue, bloomy. Ga. to Tex., W. Indies; adaptable only far S. Var. **Bedfordiana**, juvenile form with needle-like lvs.

macrocarpa (*J. neaboriensis*). Plum J. Shrub or dense pyramidal tree to 12 ft.: lvs. linear, spreading, spiny-pointed: fr. dark brown, bloomy. Medit. region; to be grown far S.

mexicana. Tree to 30 ft. and more: lvs. mostly scale-like: fr. dark blue, bloomy. Tex., Mex.; to be planted far S.

monosperma. Cherrystone J. Tree to 50 ft.: lvs. mostly scale-like, grayish-green: fr. dark blue, bloomy. Colo. to Tex. and Mex.; useful in lower S.

nana: *J. communis* var. *montana.*

neaboriensis: *J. macrocarpa* or *J. chinensis* var. *mas.*

oblonga pendula: *J. formosana.*

occidentalis (*Sabina occidentalis*). Shrub or tree to 40 ft. and more: lvs. mostly scale-like, overlapping, grayish-green: fr. bluish-black, bloomy. Wash. to S. Calif.; to be planted only far S. on eastern side of continent.

Oxycedrus. Prickly J. Shrub or tree to 30 ft.: lvs. linear, spreading, spiny-pointed: fr. somewhat bloomy. Medit. to Persia; adaptable only far S.

pachyphlæa. Alligator J. Tree to 60 ft. with checkered bark: lvs. mostly scale-like, bluish-green: fr. reddish-brown, bloomy. Tex., Ariz., Mex.; adapted only to lower S.

phœnicea. Shrub or tree to 20 ft.: lvs. mostly scale-like, dark or bluish-green: fr. yellow or reddish-brown. Medit. region, and to be planted only far S.—The name *Longsgoldiana* is listed here.

Pinchotii. Tree to 20 ft.: lvs. mostly scale-like: fr. reddish-brown. Tex.

procera. AFRICAN J. Tree to 100 ft. and more: lvs. of 2 kinds, lanceolate and spreading, or scale-like: fr. brown or purplish. E. Afr.

procumbens. Spreading shrub to 2 ft. high: lvs. linear-lanceolate, spiny-pointed, glaucous above and bluish below. Japan, where it is cult., and hardy in northern states.

prostrata: *J. horizontalis.*

pseudosabina. Low shrub: lvs. of 2 kinds, scale-like and needle-shaped. Turkestan.

recurva. Tree to 30 ft., with curved branches and drooping branchlets: lvs. linear-lanceolate, grayish or bluish-green with white band above: fr. brown or purple. Himalayas; to be tried far S.

rigida. NEEDLE J. Pyramidal shrub or tree to 30 ft., with drooping branchlets: lvs. linear, spreading, spiny-pointed, yellowish-green with white band above: fr. brownish-black, bloomy. Japan, Korea, N. China; hardy in northern states, but should be protected from severe winter winds.

Sabina. SAVIN. Shrub to 10 ft., usually spreading or procumbent: lvs. of 2 kinds, needle-shaped and spreading or scale-like and overlapping, dark green: fr. brownish-blue, bloomy. Eu., W. Asia; hardy in northern states.—The native plant once supposed to be this species is *J. horizontalis.* Some of the hort. vars. are: **cupressifolia**, procumbent, with scale-like lvs.; **fastigiata** (sometimes called *erecta*), shrub of columnar habit; **lusitanica**, upright shrub with scale-like lvs.; **tamariscifolia**, lvs. usually all needle-shaped, bright green; **variegata**, branchlets variegated creamy-white. The name *Hillii* also occurs.

saltuaria. Tree to 50 ft.: lvs. overlapping, mostly scale-like, bright green: fr. black. W. China.

scopulorum (*Sabina scopulorum*). COLORADO RED-CEDAR. Tree to 30 ft. and more: lvs. overlapping, scale-like, yellowish-green or glaucous: fr. bright blue, bloomy. B. C. to Calif., and hardy in eastern states. Var. **argentea** is a pyramidal form with silvery-white lvs. Var. **horizontalis** has spreading branches and bluish-white lvs. Var. **viridifolia** is a bright green form of pyramidal habit.

sphærica (*J. Fortunei*). A species from N. China, but the material cult. under this name is *J. chinensis.*

squamata (*J. recurva* var. *densa*). Decumbent shrub: lvs. linear or lanceolate, pointed, grayish- or bluish-green with 2 white bands above: fr. brown to black. E. Asia, and hardy in northern states. Var. **Fargesii** is a tree to 70 ft. Var. **Meyeri** is an upright dense shrub with bluish-white lvs. Var. **prostrata** is a prostrate form. Var. **Wilsonii** is a shrub to 6 ft. with branchlets recurved at tips.

taxifolia. Differs from *J. formosana* in the obtuse lvs. and shiny light brown fr. Bonin Isls.

thurifera. Pyramidal tree to 40 ft.: lvs. scale-like or needle-shaped: fr. dark blue, bloomy. S. Eu., N. Afr.; to be planted only in lower S.

utahensis (*Sabina utahensis*). Tree to 20 ft.: lvs. mostly scale-like, overlapping, light yellowish-green: fr. reddish-brown, bloomy. Wyo. to Calif.; not hardy in northeastern states. Var. **megalocarpa** is taller with a single trunk.

venusta: *J. virginiana* var.

virginalis globosa: *J. chinensis* var. *globosa.*

virginiana. RED-CEDAR. Tree to 100 ft.: lvs. scale-like and overlapping or spreading and needle-like: fr. bluish, bloomy. Me. to Fla.—Liable to attacks of red-spider. There are numerous garden vars. as follows: **albospica** and "Triomphe d'Angers," tips of branchlets white; **Canaertii**, pyramidal form with dark green lvs.; **Chamberlaynii**, branchlets drooping and elongated; **elegantissima**, tips of branchlets golden-yellow; **filifera**, branchlets slender and much divided; **glauca**, lvs. very glaucous; **globosa**, globose form with bright green scale-like lvs.; **Keteleeri**, of pyramidal habit with dark green scale-like lvs.; **Kosteri**, low form with glaucous lvs.; **pendula**, branchlets slender and drooping; **plumosa**, of pyramidal habit, white-tipped; **pyramidalis**, of dense columnar habit; **pyramidiformis**, pyramidal with lvs. turning purple; **reptans**, low shrub with spreading branches; **Schottii**, columnar, with scale-like lvs. bright green; **tripartita**, dwarf densely branched form: **variegata**, branchlets variegated with white; **venusta** (*J. venusta*), of columnar habit, lvs. shiny dark green. Other listed names are *Burkii, cylindrica, Smithii, viridis.*

Wallichiana. Shrub or tree to 60 ft.: lvs. scale-like and needle-shaped, bright green: fr. blue. S. W. China; to be planted only in mild climates.

Whittmanniana: a listed name.

JUPITERS-BEARD: *Anthyllis Barba-Jovis, Centranthus ruber.*

JUSSIÆA. PRIMROSE-WILLOW. *Onagraceæ.* Per. herbs or rarely shrubs, with alternate simple lvs., yellow or white fls. solitary in the axils, and capsular frs.

Jussiæas are grown in the aquatic or damp garden, and mostly treated as tender annuals. Seeds should be sown in pots or pans which after two days should be submerged in water. The seedlings should be transferred to pots and it is not always necessary to keep them under water.

longifolia. Erect, to 2 ft.: lvs. linear-lanceolate, long-pointed: fls. yellow. Brazil.

repens. St. creeping, rooting at nodes: lvs. oval to spatulate, to 3 in. long: fls. yellow, ½ in. long. Tropics.

JUSTICIA. *Acanthaceæ.* Trop. herbs and shrubs allied to Jacobinia and distinguished by technical characters of the stamens and pollen-grains. Cult. as for *Jacobinia.*

carnea: *Jacobinia carnea.*

coccinea: *Pachystachys coccinea*; see also *Odontonema strictum.*

Ghiesbreghtiana: *Jacobinia Ghiesbreghtiana.*

magnifica: *Jacobinia carnea.*

Mohintli: *Jacobinia spicigera.*

secunda. RED J. Shrub to 8 ft.: lvs. ovate-oblong, to 6 in. long, long-acuminate: fls. red, 1½ in. long, deeply 2-lipped, on narrow terminal panicles. N. S. Amer.

spicigera: *Jacobinia spicigera.*

JUTE: *Corchorus capsularis.*

K

KADSURA. *Magnoliaceæ.* Evergreen woody twiners from trop. Asia with simple lvs., unisexual usually solitary fls., and fr. a globose head of berries (separate carpels) which are ornamental in autumn. Propagated by cuttings of half-ripened wood under glass. To be planted far S.

japonica. Lvs. oval to oblong-lanceolate, to 4 in. long, slightly toothed: fls. yellowish-white, ¾ in. across, not showy, stalked: fr. scarlet, the heads about 1 in. across. Japan, Korea.

KAFIR: *Holcus Sorghum* var. *caffrorum.*

KAGENECKIA. *Rosaceæ.* Small evergreen trees from Chile with leathery sharp-toothed lvs. and diœcious fls., the pistillate solitary and staminate in racemes or corymbs; one species intro. in S. Calif.

oblonga. To 30 ft.: lvs. oblong: fls. white, ¾ in. across. Chile.

KAKI: *Diospyros Kaki.*

KALANCHOË. *Crassulaceæ.* Succulent trop. per. herbs or subshrubs, mostly in Afr. and Asia, with opposite fleshy lvs. that are sometimes pinnatifid, and yellow, scarlet or purple fls. in terminal panicled cymes, the corolla urn-shaped or salverform.

The kalanchoes are grown in the greenhouse or out-of-doors in the South for the bloom. The cultivation is not peculiar. Propagated by cuttings and seeds.

carnea. To 2 ft.: lvs. oval, to 4 in. long, coarsely toothed: fls. pink, fragrant, ½ in. across. S. Afr.—A good conservatory plant for winter bloom; seeds sown in spring should give flowers at the holidays.

coccinea. To 4 ft.: lvs. ovate to lanceolate, to 4 in long, coarsely toothed: fls. scarlet or orange, ½ in across. Trop. Afr.—Planted in S. Fla. and tropics.

crenata. To 6 ft., with thick root: lvs. oblong to spatulate, to 3 in. long, coarsely toothed: fls. yellow or orange. Trop. Afr.

flammea. To 1½ ft.: lvs. ovate-oblong, 2 in. long, entire or slightly toothed: fls. yellow and orange-scarlet, ½ in. across. Trop. Afr.—A good subject for a rather cool greenhouse.

kewensis. Hybrid between *K. flammea* and *K. Bentii,* the latter a white large-fld. species from Arabia, 3 ft., with somewhat terete and pointed lvs. in pairs at top of st., but apparently not in cult. with us.

spathulata. To 4 ft.: lvs. spatulate-oblong, to 10 in. long, wavy-toothed: fls. yellow. Trop. Asia.

KALE, BORECOLE (*Brassica oleracea* var. *acephala*). Hardy cool-season plants grown as greens or pot-herbs, for their succulent edible leaves which are used either in autumn or spring. For autumn crop, seeds are sown in late spring where the plants are to stand or in some cases in seed-beds and the young plants transplanted. In the middle regions, as about Norfolk, kale is mostly a spring crop, seeds being sown in late summer or in autumn, the plants standing in the field over winter. In market kale, the entire plant is cut; in kitchen-gardens leaves are often taken as needed and the plants allowed to stand, in which case the distances between them may be 10–24 inches in the row depending on the variety. When the entire plant is to be removed in harvesting, the space need be only half as much or even less. The curled or crimped varieties are usually most prized. The plant goes to seed the second year. The pests are those of cabbage. See *Collard.*

KALMIA. *Ericaceæ.* N. American (one in Cuba) mostly evergreen shrubs with simple entire lvs., purple, pink or white fls. which are bell-shaped or saucer-shaped and bear 10 pouches on the corolla in which the anthers are held back until they discharge the pollen. The following species are amongst the good broad-leaved evergreens.

Most of the species are hardy North and very ornamental. They succeed on sandy or peaty soils which are rather moist, but do not thrive on clay or limestone. Plants can be transplanted from the wild and a mulch should be provided the first year. Propagated by seeds sown in pans of sandy peat or sphagnum and set out-of-doors the following year; also by cuttings of half-ripened wood under glass, by layers, and varieties by veneer-grafting.

angustifolia. LAMBKILL. SHEEP-LAUREL. To 3 ft.: lvs. usually opposite, to 2½ in. long: fls. purple or crimson, to ½ in. across, in lateral corymbs, June-July. E. N. Amer. Var. **candida** has white fls.

carolina. Resembling *K. angustifolia* but with smaller lvs. gray-pubescent beneath and purplish fls. Va. to S. C.

glauca: *K. polifolia.*

latifolia. MOUNTAIN-LAUREL. CALICO-BUSH. To 10 ft. or more: lvs. alternate or irregular, to 5 in. long: fls. rose marked inside with purple, 1 in. across, in large terminal corymbs, May–June. E. N. Amer. Var. **alba,** fls. white. Var. **myrtifolia,** dwarf, lvs. to 2 in. long. Var. **polypetala,** corolla deeply cut.

microphylla: *K. polifolia* var.

polifolia (*K. glauca*). BOG K. To 2 ft.: lvs. opposite or in 3's, to 1½ in. long, glaucous-white beneath: fls. rose-purple, ½ in. across, in terminal corymbs, May–June. N. Amer. Var. **microphylla** (*K. microphylla*), to 8 in., lvs. to ¾ in. long. W. N. Amer.

KALOPANAX: *Acanthopanax ricinifolium.*

KALOSANTHES: *Rochea coccinea.*

KANGAROO-THORN: *Acacia armata.*

KAPOK: see *Ceiba.*

KARANDA: *Carissa Carandas.*

KARO: *Pittosporum crassifolium.*

KARUM OIL TREE: *Pongamia pinnata.*

KASSOD TREE: *Cassia siamea.*

KATSURA-TREE: *Cercidiphyllum japonicum.*

KAULFUSSIA AMELLOIDES: *Charieis heterophylla.*

KEELED: ridged like the bottom of a boat; the two front united petals of a papilionaceous flower constitute a keel.

KEI-APPLE: *Dovyalis caffra.*

KENNEDIA. *Leguminosæ.* Trailing or climbing shrubs with pinnate lvs. mostly of 3 lfts. but sometimes 5 or 1, papilionaceous fls.

usually in axillary pairs, umbels or racemes, and linear pods; native in Australia and grown in N. Amer. for ornament under glass and in the open in S. Calif. and elsewhere. Propagated by seeds and cuttings.

Comptoniana: *Hardenbergia Comptoniana.*

Marryattæ: *K. prostrata* var. *major.*

monophylla: *Hardenbergia monophylla.*

nigricans (*Lotus nigricans*). Robust twiner: lfts. 3 or sometimes reduced to 1, broadly ovate: fls. purple-black blotched with green on the standard, in a one-sided raceme: pods flattened.

ovata: *Hardenbergia monophylla.*

prostrata. Prostrate: lfts. 3, broadly obovate: fls. scarlet, 2–4 together on a long stalk: pods nearly cylindrical. Var. **major** (*K. Marryattæ*) is a larger twining form.

KENTIA. *Palmaceæ.* As currently understood there are only 2 true Kentias and probably neither one is known in general cult. or in this country. The original species, *K. procera*, is native in New Guinea and the other, *K. Ramsayi*, on Crocker Isl., N. Australia. Some 50 names have been made in Kentia, but as all these palms have become better understood they have been referred to other genera. Names appearing in hort. literature are as follows:

Baueri: *Rhopalostylis Baueri.*

Belmoreana: *Howea Belmoreana.*

Canterburyana: *Hedyscepe Canterburyana.*

Forsteriana: *Howea Forsteriana.*

Joannis: *Veitchia Joannis.*

Kersteniana: *Balaka perbrevis.*

Lindenii: *Chambeyronia.*

Macarthuri: *Actinophlœus Macarthuri.*

macrocarpa: *Chambeyronia macrocarpa.*

præmorsa: probably *Balaka perbrevis.*

Sanderiana: *Actinophlœus Sanderiana.*

sapida: *Rhopalostylis sapida.*

singaporensis: see *Hydriastele Wendlandiana.*

Wendlandiana: *Hydriastele Wendlandiana.*

KENTIOPSIS. *Palmaceæ.* As now defined, 1 species of feather-palm, *K. olivæformis*, a lofty tree of New Caledonia and apparently not in cult. For *K. macrocarpa*, see *Chambeyronia.*

KENTROPHYLLUM: *Carthamus.*

KERNERA. *Cruciferæ.* A few per. species in the mts. of S. and Cent. Eu., by some authors united with Cochlearia, from which the genus differs only in technical characters; one species is grown in rock-gardens. **K. saxatilis** (*Cochlearia saxatilis*) grows 2–12 in. high, glabrous or nearly so: lower lvs. oblong to spatulate and somewhat dentate, in a rosette, st.-lvs. few, lanceolate: fls. white, in a terminal raceme, in summer.

KERRIA. *Rosaceæ.* A well-known Chinese deciduous green-twigged shrub commonly planted for ornament and hardy N., **K. japonica** (*Corchorus japonicus*). To 8 ft.: lvs. oblong-ovate, to 2 in. long, doubly toothed: fls. golden-yellow, to 2 in. across, solitary. Var. **aureo-vittata**, branchlets striped green and yellow. Var. **picta** (var. *argenteo-variegata*), lvs. edged with white. Var. **pleniflora**, fls. double, the prevailing form.—Kerria does well in partial shade. Propagated by cuttings, layers, and division of the roots.

KETELEERIA. *Pinaceæ.* Evergreen trees of 2 or more species in China, adapted only to the lower S. and similar climates, having solitary linear lvs. pale beneath and large erect cones with woody persistent scales; belongs to the Abies group. For cult. see *Conifers.*

Davidiana. To 120 ft.: lvs. rounded or notched at apex: cones to 8 in. long.

Fortunei. To 100 ft., young branchlets orange-red: lvs. spiny-pointed becoming blunt: cones to 7 in. long.

KHAT: *Catha edulis.*

KHUS-KHUS: *Anatherum zizanioides.*

KICKXIA (*Elatinoides*). *Scrophulariaceæ.* Ann. creeping herbs of the Old World, the fls. solitary, irregular, 2-lipped, corolla spurred and throat closed by palate; 2 species sometimes planted for ground-cover in rockeries.

Elatine (*Linaria Elatine*). Lvs. ovate-hastate, to 1 in. long: fls. yellowish, purplish outside, ¼ in. long, spur straight. Eu., Asia; nat. in E. N. Amer.

spuria (*Linaria spuria*). Lvs. ovate, to 1 in. across: fls. yellowish with upper lip purple, spur curved. Eu.; nat. in E. N. Amer.

KIGELIA. *Bignoniaceæ.* Trop. African trees with pinnate lvs., bell-shaped 2-lipped orange or red fls. in long-stalked drooping panicles, and hard cylindrical indehiscent frs.; grown in S. U. S. as an oddity.

pinnata. SAUSAGE-TREE. To 50 ft.: lvs. ternate, with 7–9 oval-oblong lfts. to 6 in. long: fls. claret-colored, to 3 in. long: fr. somewhat gourd-like, to 1½ ft. long, swinging on cord-like stalks to several ft. long.

KIRENGESHOMA. *Saxifragaceæ.* One Japanese per. occasionally grown in the garden. **K. palmata.** To 4 ft.: lvs. nearly orbicular, dentate and some of them somewhat palmately 7–10-lobed, to 4 in. or more across: fls. yellow, to 1¾ in. long, bell-shaped and nodding, 1–3 together, the calyx prominent.—Propagated by division.

KITAIBELIA. *Malvaceæ.* One, or perhaps more, species native in the Danube region. **K. vitifolia.** Per. to 8 ft.: lvs. grape-like, 5-lobed or -angled, toothed, to 3 in. or more long: fls. white or rose, large, solitary or in axillary clusters.—Of easy cult. in good garden soil. Propagated by division or seeds.

KITAMBILLA: *Dovyalis hebecarpa.*

KLEINIA: *Senecio.*

KNAPWEED: *Centaurea nigra.*

KNEIFFIA: *Œnothera.*

KNIGHTIA. *Proteaceæ.* Trees or shrubs of New Zeal. and New Caledonia, one occasionally planted in Calif.: lvs. alternate, leathery: fls. in densely-fld. racemes: fr. a leathery follicle.

excelsa. Tree to 90 ft., resembling a Lombardy poplar in habit: lvs. oblong, to 6 in. long, very stiff: fls. to 1½ in. long, brown-tomentose, in racemes to 4 in. long. New Zeal.

KNIPHOFIA (*Tritoma*). TORCH-LILY. POKER-PLANT. *Liliaceæ.* Per. herbs with thick roots, clumps of long grass-like basal lvs., and red or yellow drooping fls. in showy poker-like spikes or racemes terminating the scape, in summer and autumn, the perianth-segms. united into a long tube; native in Afr.

Poker-plants may be hardy in the North with a winter mulch, but it is safer to lift the roots in autumn and store in a cellar in boxes of dry earth. Propagated by root-division, offsets if produced, and seeds.

alooides: *K. Uvaria.*

caulescens. St. to 1 ft.: lvs. to 3 ft. long and 3 in. across, glaucous: fls. red or lower ones yellow, 1 in. long, in spikes 6 in. long, the stamens exserted. S. Afr.

corallina. Hybrid between *K. Macowanii* and *K. Uvaria*: to 2 ft.: fls. coral-red.

foliosa (*K. Quartiniana*). To 3 ft.: lvs. to 3 ft. long and 2 in wide: fls. yellow, 1 in. and less long, the stamens much exserted. Trop. and S. Afr.—One of the usual species, the fls. small.

grandiflora: a form of *K. Uvaria.*

hybrida: a group name to include hybrid and hort. forms.

Macowani. To 2 ft.: lvs. to 2 ft. long and ⅙ in. across: fls. yellowish- or orange-red, 1 in. long, in dense racemes to 4 in. long, the stamens not exserted. S. Afr.

Nelsoni. Lvs. to 2 ft. long and 1/16 in. across: fls. bright scarlet or tinged orange, 1¼ in. long, in racemes to 3 in. long, stamens included. S. Afr.

nobilis: hort. form, probably of *K. Uvaria.*

Pfitzeri: a form of *K. Uvaria.*

præcox: a form of *K. Uvaria* flowering in summer or autumn.

pyramidalis: hort. form of *K. foliosa.*

Quartiniana: *K. foliosa.*

rufa. Lvs. to 1½ ft. long and ⅓ in. across: fls. yellow, the upper tinged red, ¾ in. long, drooping, in racemes to 6 in. long, the stamens exserted. Natal.

sarmentosa. To 3 ft.: lvs. to 3 ft. long and 1 in. across: fls. red or yellow tinged red, to 1 in. long, in racemes to 1 ft. long, the stamens exserted. S. Afr.

Saundersii: a form of *K. Uvaria* but some of the stock passing under this name in the trade is *K. foliosa.*

semperflorens: a hort. name.

tricolor: hort. form.

Tuckii. Lvs. to 1½ ft. long and ¾ in. across: fls. yellow tinged with red, ½ in. long, in dense racemes to 6 in. long, stamens slightly exserted. S. Afr.

Uvaria (*K. alooides*). To 4 ft.: lvs. to 3 ft. long and 1 in. across: fls. scarlet or lower ones yellow, to 2 in. long, in racemes to 10 in. long, the stamens scarcely exserted. S. Afr. Var. **floribunda** flowers earlier, and var. **grandiflora** is larger.—One of the well-known species, with large fls.

KNOTROOT: *Stachys Sieboldii.*

KNOTWEED: *Polygonum.*

KOA: *Acacia Koa.*

KOCHIA. *Chenopodiaceæ.* Herbs or subshrubs with alternate, narrow, entire lvs. and small fls. solitary or clustered in the axils; one species grown for ornament. Seeds may be sown in the open about May 1st or started in the greenhouse earlier and transplanted.

Childsi: an unidentified trade name.

hyssopifolia. Ann. to 1½ ft.: lvs. oblong-linear, to 4 in. long. S. Eu., W. Asia.

scoparia. SUMMER-CYPRESS. BELVEDERE. Ann. to 5 ft., of columnar, pyramidal or globular habit: lvs. linear, to 2 in. long, ciliate. Eu.; nat. in N. Amer. Var. **trichophila** (*K. trichophylla*) is of globular dense habit and the foliage turns purplish-red in autumn; the form most commonly grown for borders and formal effects.

trichophylla: *K. scoparia* var. *trichophila.*

KŒLERIA. *Gramineæ.* Tufted ann. or per. grasses with flat or involute lvs. and spikelets in dense spike-like contracted panicles; widely distributed in temp. regions, a few of ornamental value. See *Grasses.*

berythea: *K. phleoides.*

brachystachya: *K. phleoides.*

cristata. Per. to 2½ ft.: lvs. to 1 ft. long and 1/12 in. wide, flat or involute: panicles to 7 in. long, branches erect, shining. N. Amer., Eu., Asia.

phleoides (*K. berythea. K. brachystachya*). Ann. to 1 ft.: lvs. to 5 in. long and ¼ in. wide, flat, hairy: panicles to 3 in. long, dense and cylindrical. Medit. region; nat. in Calif.

KOELLIA: *Pycnanthemum.*

KŒLREUTERIA. *Sapindaceæ.* Trees from China and Japan with alternate pinnate lvs., irregular yellow polygamous fls. in terminal panicles, and fr. a bladdery caps.; grown for ornament.

The species are not particular as to soil but prefer sunny locations. Propagated by seeds in autumn or stratified, or by root-cuttings.

bipinnata. To 60 ft.: lvs. bipinnate, lfts. ovate or ovate-oblong, to 4 in. long, equally toothed. China; not hardy N.

formosana. To 60 ft.: lvs. bipinnate, to 1½ ft. long, of ovate-lanceolate shallowly toothed lfts.: frs. papery, to 2 in. long, of 3 roundish valves. Formosa; suitable for Fla. to Calif.

japonica: *K. paniculata.*

paniculata (*K. japonica*). GOLDENRAIN-TREE. To 30 ft.: lvs. of 7–15 ovate to oblong coarsely toothed and notched lfts. to 3 in. long: panicles to 1½ ft. long, July–Aug., showy: frs. papery, to 2 in. long, separating into 3 pointed valves. China, Korea, Japan; hardy in northern states.

KOHLRABI (*Brassica caulorapa*). The so-called "stem-turnip" because the turnip-like tuber is an enlargment of the stem 1 to 3 inches above the ground. It is a low biennial plant of unknown nativity, producing seeds the second year from old stocks left over or planted out. The tuberous stem is used the same as turnips, both for the table and for stock feed. For the table the tubers should be taken when 2 or 3 inches in diameter, before they become hard and bitter. Kohlrabi is grown the same as turnips. Seeds are usually sown where plants are to stand, in rows far enough apart for tillage (say 18–20 inches), and thinned to 5 to 10 inches in the row; sow from early spring to early summer if succession is desired, as for table turnips. Keep the plants growing rapidly for soft and comestible tubers. Pests are those of the cabbage. There are green and purplish races.

KOHUHU: *Pittosporum tenuifolium.*

KOKIA. *Malvaceæ.* Hawaiian trees of 2 species allied to Gossypium and Hibiscus, with simple lobed lvs.: fls. solitary in axils of uppermost lvs., with 3 persistent bracteoles: fr. a woody ovoid caps.: one species has been intro. in S. Fla.

drynarioides. To 15 ft. or more: lvs. 5–7-lobed, long-stalked: fls. red, to 4 in. long: caps. 1 in. across.—Yet very rare in cult.

KOLKWITZIA. *Caprifoliaceæ.* One showy Chinese deciduous shrub to 6 ft., hardy in the northern states. Propagated by cuttings of green wood late in summer. **K. amabilis.** BEAUTY-BUSH. Lvs. opposite, ovate, to 3 in. long: fls. pink with yellow throat, bell-shaped,

½ in. long, with bristly sepals and pedicels, borne in corymbs to 3 in. across, May-June: fr. bristly, ¼ in. long.

KONIGA: *Lobularia.*

KORTHALSIA. *Palmaceæ.* Climbing hook-bearing hermaphrodite palms of the Indo-Malayan region, 25–30 species: lvs. pinnate or pinnatisect, pinnæ broadened upwards and more or less erose, the rachis mostly prolonged into a whip-like part bearing sharp claws; petiole short, the sheath sometimes developed into an ant-nesting body: spadices axillary, loosely branched and pendulous, the branches cylindrical and catkin-like; stamens 6 or more: fr. globose or ovoid, small, scale-covered. Little known to hort., as is the case also with Calamus and Dæmonorops.

Junghuhnii: *K. robusta.*

robusta (*K. Junghuhnii*). Low, st. size of finger: lvs. with petiole to 5 ft., pinnatisect; segms. or pinnæ 9–15, alternate or nearly opposite, rhomboid or trapezoid to cuneate-oblong, acuminate, many-nerved, small-toothed at apex: pistillate spadix 8 in. long, dense, and 1 in. thick. In moist woods, Java, Sumatra, Borneo.

KOSTELETZKYA. *Malvaceæ.* Herbs or shrubs somewhat like Hibiscus, with arrow-shaped lvs., pink, purple or white fls., involucels of linear bracts, and fr. a 5-angled caps.; a few species are native in Amer., 2 in the U. S. and others in Eu. and Afr.

hispida. Herb to 3 ft.: lvs. to 2 in. long, pubescent: fls. yellow, about ½ in. long, 1–3 in the axils. Madagascar.

virginica. Per. to 4 ft.: lvs. to 5 in. long, pubescent: fls. pink, to 2½ in. across, in terminal panicles. Marshes, N. Y. to Fla. and La.

KOUSA: *Cornus Kousa.*

KOWHAI, RED: *Clianthus puniceus.*

KRAMERIA. *Leguminosæ.* Per. herbs or shrubs with alternate lvs., simple or 3-parted, and irregular purple fls. solitary or in racemes, the 3 upper petals long-clawed; native S. U. S. to Chile.

secundiflora. Per. with decumbent sts. to 1½ ft. long: lvs. lanceolate or linear, to 1 in. long: fls. about 1 in. across. Fla. to Mex.

KRAUNHIA: *Wisteria.*

KRAUSSIA FLORIBUNDA: *Tricalysia Kraussiana.*

KRIGIA (*Adopogon*). *Compositæ.* Ann. or per. N. American small herbs with mostly basal lvs. and solitary or clustered heads of yellow or orange ligulate fls.; pappus of scales and bristles. Sometimes planted for the bright fl.-heads.

montana. Per. to 1 ft., branched: lvs. linear, to 8 in. long, entire or pinnately cut: heads bright yellow, 1 in. across. N. C. to Ga.

virginica. Ann. to 1 ft. or less, unbranched: lvs. radical, oblong or oval, to 8 in. long, toothed or pinnately cut: heads orange or reddish-orange, ½ in. across. Mass. to Ga. and Kans.

KRISHUM: *Iris ensata* var. *pabularia.*

KRYNITZKIA: *Cryptantha barbigera.*

KUDZU-VINE: *Pueraria Thunbergiana.*

KUHNIA. *Compositæ.* Per. herbs of N. Amer., having alternate resinous-dotted lvs. and heads of white or purplish disk-fls. borne in terminal corymbs; pappus of plumose bristles. Sometimes planted in the border.

eupatorioides. To 3 ft.: lvs. lanceolate, slightly toothed or entire: heads ½ in. long. N. J. to Ga. and Tex.

KULUI: *Nototrichium sandwicense.*

KUMQUAT: *Fortunella*; see *Citrus Fruits* (page 155). **Australian Desert:** *Eremocitrus.*

KUNZEA. *Myrtaceæ.* Australian shrubs, usually heath-like, with mostly small entire alternate lvs., small fls. with numerous exserted stamens, and capsular frs.; grown in Calif.

ambigua (*K. corifolia*). Very similar to *K. peduncularis* but differing in the fls. being sessile.

corifolia: *K. ambigua.*

micrantha. Small shrub: lvs. linear, to ⅓ in. long, stiff: fls. in dense terminal heads.

peduncularis. Tall erect shrub: lvs. linear or linear-lanceolate, mostly ½ in. long: fls. white or whitish, short pedicelled, in axils on upper branches and forming leafy corymbs or racemes.

sericea. Tall shrub: lvs. obovate, to ½ in. long, stiff, silvery-white: fls. polygamous, the bisexual solitary, staminate in terminal clusters.

KUNZIA: *Purshia.*

KURRAJONG: *Brachychiton populneum.*

L

LABIATÆ. MINT FAMILY. Herbs and shrubs of about 160 widely distributed genera; plants aromatic, with usually 4-angled sts., opposite or whorled lvs., irregular 2-lipped bisexual gamopetalous fls. with variously ribbed calyx, 4 or 2 stamens, superior deeply 4-lobed ovary and 2 stigmas, and fr. of 4 one-seeded nutlets. The family is rich in volatile oils which are extracted for medicinal and other purposes. The genera known to hort. are mostly flower-garden subjects and sweet-herbs, as Agastache, Ajuga, Audibertia, Ballota, Brittonastrum, Cedronella, Coleus, Collinsonia, Colquhounia, Cunila, Dracocephalum, Elsholtzia, Eremostachys, Hedeoma, Hemiandra, Horminum, Hyssopus, Iboza, Lallemantia, Lamium, Lavandula, Leonotis, Leonurus, Lycopus, Majorana, Marrubium, Melissa, Mellittis, Mentha, Micromeria, Molucella, Monarda, Monardella, Nepeta, Ocimum, Origanum, Perilla, Perovskia, Phlomis, Physostegia, Prostanthera, Prunella, Pycnanthemum, Pycnostachys, Rosmarinus, Salvia, Satureia, Scutellaria, Sideritis, Sphacele, Stachys, Teucrium, Thymus, Trichostema, Westringia.

LABIATE: lipped; as a noun, a member of the Labiatæ.

LABLAB: *Dolichos Lablab.*

LABURNOCYTISUS. *Leguminosæ.* Hybrids between the genera Laburnum and Cytisus.

Adami (*Laburnum Adami*). Hybrid between *L. anagyroides* and *C. purpureus:* resembles *L. anagyroides* but has smaller lfts. and fls. suffused with purple.

LABURNUM. *Leguminosæ.* Ornamental trees and shrubs with alternate lvs. composed of 3 lfts., yellow papilionaceous fls. in terminal racemes, and flattened pods; native in S. Eu. and W. Asia.

Laburnums are mostly hardy North. Propagated by seeds, layers, and choice varieties by grafting and budding on seedling stocks.

Adami: *Laburnocytisus Adami.*

alpinum (*Cytisus alpinus*). SCOTCH L. To 30 ft.: racemes to 15 in. long, pendulous, June–July: pods with thin wing on upper margin. S. Eu. Var. **pendulum** has pendulous branches.

anagyroides (*L. vulgare. Cytisus Laburnum*). GOLDEN-CHAIN. BEAN-TREE. To 30 ft.: racemes 4–8 in. long, pendulous, May–June: pods thickened on upper margin, pubescent. Cent. and S. Eu. Var. **Alschingeri** has lfts. more silky beneath. Var. **aureum** has yellow foliage. Var. **autumnale** blooms again in late summer. Var. **bullatum** (*L. vulgare involutum*) has curled lfts. Var. **Carlieri**, lfts. smaller. Var. **pendulum,** branches pendulous. Var. **quercifolium**, lfts. lobed.

Vossii. Hybrid between *L. alpinum* and *L. anagyroides.*

vulgare: *L. anagyroides.*

Watereri (*L. vulgare* var. *Parksii*). Hybrid between *L. alpinum* and *L. anagyroides.*

LACEBARK: *Gaya Lyallii.*

LACE-FLOWER, BLUE: *Trachymene cærulea.*

LACE-LEAF: *Aponogeton fenestralis.*

LACE-VINE: *Polygonum Auberti.*

LACHENALIA. CAPE-COWSLIP. *Liliaceæ.* S. African small bulbous herbs with usually 2 basal lvs. and red or yellow fls. in racemes or spikes terminating the scape, the perianth-segms. partially united.

Plant in pots of rich loam in August and keep in coldframe until the last of November when they should be removed to the greenhouse with a night temperature of 50°. After flowering they should be placed in a light place and watered until ripening after which they should be kept dry and dark until repotted. Propagated by offsets and seeds.

Nelsoni: *L. tricolor* var.

pendula. To 1 ft. and more: lvs. to 2 in. across: fls. to 1½ in. long, drooping, the red-purple-tipped inner segms. only slightly longer than the outer segms. which are yellow and red above.

tricolor. To 1 ft.: lvs. to 1 in. across: fls. 1 in. long, drooping, yellow tipped with red, the outer segms. much shorter than inner. Color variations are: **luteola,** lemon-yellow tipped with green; **Nelsoni,** bright yellow tinged green; **quadricolor,** red at base, greenish-yellow in middle, the outer segms. tipped with green and the inner with red-purple.

LACINARIA: *Liatris.*

LACINIATE: slashed into narrow pointed lobes.

LACQUER-TREE: *Rhus verniciflua.*

LACTUCA. *Compositæ.* Tall annuals and perennials of the northern hemisphere, often weedy and invading fields: lvs. alternate, of many forms and often pinnatifid: heads small, in irregular panicles, with yellow, pink, blue or white rays; pappus on a long or short beak terminating the flat ribbed achene or "seed." None is commonly cult. in this country for ornament; one is a garden vegetable, for which see *Lettuce.*

alpina (*Mulgedium alpinum*). Erect per. to 4 ft., st. simple and succulent, nearly glabrous: lvs. long-oblong, ovate or broader, to 8 in. across, toothed or lyrate, terminal deltoid: heads 1 in. across, rays pale blue. Arctic and alpine Eu., Siberia.

Bourgæi (*Mulgedium Bourgæi*). Per. to 6 ft., st. thick: lvs. bristly: heads small, the bracts and rays lilac. Medit.

perennis. Glabrous branched per. to 2 ft.: lvs. long-narrow, pinnately lobed, the segms. nearly linear, those on st. clasping: heads long-pedicelled, rays blue or pale violet. S. Eu.

Plumieri. Probably per., to 6 ft.: lvs. broad-oblong, bluish underneath, much cut or lyrate, to 16 in. long: heads terminal and corymbose, large, rays purple. S. France.

sativa. LETTUCE. Smooth erect ann., producing leafy branching st. 3–4 ft. high after making the lf. rosette (the "lettuce" of gardens): radical lvs. to 10 in. long, narrow to nearly orbicular, in garden forms variously curled and crisped: fl. rays light yellow. Cultigen. The different classes of lettuces may be ranged botanically as follows: Var. **asparagina** (*angustana*), Asparagus lettuce, in which the thickened st. is used for food; var. **capitata,** Head lettuces, the lvs. compacted into rather dense rosettes; var. **crispa,** Loose lettuces with crisped, crinkled or cut lvs.; var. longifolia, Cos or Romaine lettuces, with long upright columns or rolls of foliage, tending to blanche inside.

LADIES-TRESSES: *Spiranthes.*

LADYBELL: *Adenophora.*

LADY-OF-THE-NIGHT: *Brunfelsia americana.* -Slipper: *Cordula, Cypripedium, Paphiopedilum.*

LADYS-MANTLE: *Alchemilla.* -Smock: *Cardamine pratensis.* -Thumb: *Polygonum Persicaria.*

LÆLIA. *Orchidaceæ.* Trop. American epiphytes with 1- or 2-lvd. pseudobulbs and showy fls. solitary or in racemes, the sepals and petals nearly equal, the lip 3-lobed. They thrive in an intermediate temperature. See *Orchids* for cult.

acuminata: *L. rubescens.*

albida. Pseudobulbs to 2 in. high, with 2 lvs. to 6 in. long: fls. white, often tinged rose at base of lip, fragrant, 2 in. across, in 5–8-fld. racemes to 14 in. long, Dec.–Jan. Mex.

anceps. Pseudobulbs to 3 in. high, with 1 leathery lf. to 6 in. long: fls. violet-rose with yellow throat veined with purple, 4½ in. across, in 3–5-fld. racemes to 1½ ft. high, Dec.–Jan. Mex. Var. **alba** has pure white fls. except the yellow spot in throat. Var. **Dawsonii** has white fls. on scapes to 3 ft. high. Var. **grandiflora** has larger fls. Var. **Hilliana** has white sepals and petals. Var. **Percivaliana** has small fls. with sepals and petals white tinged pink, deep purple side lobes of lip and yellowish middle lobe. Var. **rosea** has bright rose-colored fls. Var. **Sanderiana** has white fls. with yellow throat and purple-edged lip. Var. **Schroederiana** has large white fls., the lateral lobes of lip streaked with purple. Var. **Stella** has pure white fls. with yellow throat. Var. **Veitchiana** has white fls. with yellow throat and lip veined with purple. Var. **Williamsii** has white fls. with yellow throat marked with purple.

Arnoldiana. Pseudobulbs to 6 in. long, with 2 leathery lvs. to 7 in. long: fls. rose with 2 yellow keels on throat, in 3–11-fld. racemes to 4 ft. long. Mex.

autumnalis. Pseudobulbs to 3 in. high, with 2 leathery lvs. to 5 in. long: fls. rose, the lip striped with purple, 4 in. across, in 3–6-fld.racemes to 20 in. high, Nov.–Jan. Mex. Var. **alba** has pure white fls.

Boothiana (*L. lobata. Cattleya lobata*). Pseudobulbs to 8 in. long, with 1 leathery lf. to 8 in. long: fls. violet-rose veined with carmine-red, 5 in. across, in 2–4-fld. racemes to 1 ft. long, May–June. Brazil.

cinnabarina. Pseudobulbs to 4 in. long, with 1 leathery lf. to 10 in. long: fls. orange-red, 3 in. across, in 3–7-fld. racemes to 1 ft. high, Feb.–May. Brazil.

cinnabrosa. Hybrid between *L. cinnabarina* and *L. tenebrosa.*

crispa. Pseudobulbs to 8 in. long, with 1 leathery lf. to 1 ft. long: fls. white with yellow throat, the middle lobe of lip purple edged with white, lip and petals with wavy margins, 5 in. across, in 4–7-fld. racemes to 14 in. high, July–Aug. Brazil.

crispilabia (*L. cinnabarina* var. *crispilabia*). Fls. amethyst-purple, lip crisped and wavy. Brazil.

Dayana: *L. pumila* var.

Digbyana: *Brassavola Digbyana.*

elegans: *Læliocattleya elegans.*

flava. Pseudobulbs 1½ in. high, with 1 lf. to 3 in. long: fls. golden-yellow, to 2½ in. across, in 5–9-fld. racemes to 10 in. long, the lip fringed, May–June. Brazil.

glauca: *Brassavola glauca.*

Gouldiana. Pseudobulbs to 5 in. high, with 2 lvs. to 6 in. long: fls. dark rose with yellow throat, 4 in. across, in 3–5-fld. racemes to 1½ ft. long, the lip fringed, Nov. Mex.

grandis. Pseudobulbs to 10 in. high, with 1 lf. to 10 in. long: fls. 6 in. across, 2 together; sepals and petals brownish-yellow; lip white veined with violet, the lip wavy-toothed, Apr.–June. Brazil.

harpophylla. Pseudobulbs to 8 in. high, with 1 leathery lf. to 8 in. long: fls. orange-red, the lip yellow edged with white, to 3 in. across, in 3–6-fld. racemes shorter than lvs., Feb.–Mar. Brazil.

Jongheana. Pseudobulbs with 1 lf. to 6 in. long: fls. to 5 in. across, 1–2 together; sepals and petals violet or violet-red; lip yellow with violet at base, rose at tip, wavy, Feb.–Apr. Brazil.

Latona. Hybrid between *L. cinnabarina* and *L. purpurata.*

Lindleyana. Pseudobulbs to 8 in. high, with 2 leathery lvs. to 5 in. long: fls. white marked with purple, 4 in. across, in 2- or more-fld. racemes. Brazil.

lobata: *L. Boothiana.*

majalis: *L. speciosa.*

monophylla (*Trigonidium monophyllum. Neocogniauxia monophylla*). Pseudobulbs with 1 leathery lf. to 3 in. long: fls. orange-red, 2 in. across, solitary, Sept.–Oct. Cuba, Jamaica.

Perrinii. Pseudobulbs with 1 lf. to 8 in. long: fls. rose with yellowish-white throat and rose-purple lip, to 5½ in. across, in 2–4-fld. racemes, Oct.–Dec. Brazil.

præstans: *L. pumila* var. *major.*

pumila. Pseudobulbs to 3 in. high, with 1 lf. to 4 in. long: fls. solitary, 4 in. across, violet-rose with a purple wavy lip, Sept.–Oct. Brazil. Var. **Dayana** has rose-purple fls. Var. **major** (*L. præstans*) has dark rose fls. with yellow throat.

purpurata. Pseudobulbs to 2 ft. long, with 1 leathery lf. to 1 ft. long: fls. 6 in. across, in 3–5-fld. racemes; sepals and petals white; lip purple-red with darker veins and yellow throat, wavy, May–July. Brazil.

rubescens (*L. acuminata*). Pseudobulbs with 1 lf. to 5 in. long: fls. white with yellow throat marked with red, in 2–8-fld. racemes to 1 ft. long, Nov.–Jan. Mex.

speciosa (*L. majalis*). Pseudobulbs to 2 in. high, with 1 or 2 lvs. to 6 in. long: fls. rose-violet, 5 in. across, in 1–2-fld. racemes as long as lvs., Apr.–May. Mex.

superbiens. Pseudobulbs to 8 in. high, with 2 leathery lvs. to 10 in. long: fls. fragrant, rose with purple lip yellow at base, 5 in. across, in 12–18-fld. racemes to 3 ft. long, Dec.–Feb. Mex., Guatemala.

tenebrosa. Similar to *L. grandis* but with larger fls. with more wavy sepals and petals and white or rose lip veined with purple, May–June. Brazil.

LÆLIOCATTLEYA. *Orchidaceæ.* A group of orchids comprising hybrids between the genera Lælia and Cattleya.

Armstrongiæ (*Lc. G. Woodhouse × C. Iris*).

Ballii (*L. cinnabarina × C. Trianæi* var. *Schroederiana*).

bella (*L. purpurata × C. labiata*).

bletchleyensis (*L. tenebrosa × C. Warscewiczii*).

Boylei (*L. anceps × C. Trianæi*).

callistoglossa (*L. purpurata × C. Warscewiczii*).

Canhamiana (*L. purpurata × C. Mossiæ*).

choletiana (*L. superbiens × C. Mossiæ*).

Colmaniana (*Lc. callistoglossa × C. Dowiana*).

Cowani (*L. cinnabrosa × C. Mossiæ*).

Cranstouniæ (*L. tenebrosa × C. Harrisoniana*).

Dominiana (*L. purpurata × C. Dowiana*).

Duncani (*Lc. Gottoiana × C. Hardyana*).

Edwardi (*L. cinnabarina × C. Hardyana*).

elegans (*Lælia elegans. L. purpurata × C. Leopoldii*).

eximia (*L. purpurata × C. Warneri*).

exoniensis (*L. crispa × C. Mossiæ*).

Fournieræ (*Lc. elegans × C. Dowiana*).

Greenwoodi (*Lc. Schilleriana × C. Hardyana*).

Haroldiana (*L. tenebrosa × C. Hardyana*).

Herscentiæ (*L. Boothiana × C. Dowiana*).

Hyeana (*L. purpurata × C. Lawrenceana* var. *Hyeana*).

labiosa (*Lc. luminosa × C. labiata*).

luminosa: *Lc. Truffautiana.*

Martineti (*L. tenebrosa × C. Mossiæ* var. *Reineckiana*).

Rothschildiana (*Lc. Martineti × C. Mossiæ*).

Thurgoodiana (*Lc. Martineti × C. Hardyana*).

Truffautiana (*Lc. luminosa. L. tenebrosa × C. Dowiana* var. *aurea*).

warnhamensis (*L. cinnabarina × C. Trianæi*).

LAGENARIA. *Cucurbitaceæ.* Long-running soft scented tender mostly monœcious ann. vine of the Old World tropics but spontaneous elsewhere and widely cult. for ornament, the hard shells of the fr. used for utensils, and young frs. said to be eaten in some countries: fls. solitary, white, long-peduncled. Readily grown from seeds. **L. leucantha** (*L. vulgaris*). WHITE-FLOWERED GOURD. To 20 ft. or more, viscid-pubescent: lvs. cordate-ovate or broader, usually not lobed: fr. smooth, hard-shelled when ripe, in many shapes and sizes, from 3 in. to 3 ft. long, nearly globular, oblong, long-cylindrical and bent, club-shaped, dumbell-shaped, crooknecked. The frs. are commonly known as gourds (see *Cucurbita Pepo* var. *ovifera*), as dipper, sugar-trough, Hercules club, calabash, bottle, knobkerrie. See *Gourd.*

LAGERSTRŒMIA. *Lythraceæ.* Trees and shrubs with mostly opposite entire lvs., showy regular fls. in panicles, and woody capsular frs.

One species is widely and commonly planted for ornament in the southern states. Of easy cultivation. Sometimes grown as pot plants in the greenhouse. Propagated by seeds or cuttings.

Flos-Reginæ: *L. speciosa.*

indica. CRAPE-MYRTLE. Deciduous shrub to 20 ft.: lvs. elliptic to oblong, to 2 in. long: fls. white, pink or purple as indicated in the varietal names **alba, purpurea, rosea, rubra,** to 1½ in. across, the petals fringed, blooming profusely all summer. China, but widely nat.

speciosa (*L. Flos-Reginæ*). QUEEN CRAPE-MYRTLE. Showy tree to 60 ft. or more: lvs. oblong to ovate, to 1 ft. long, leathery: fls. mauve to purple to 3 in. across. India to Australia.—Planted in S. Fla.

LAGUNARIA. *Malvaceæ.* One tree native in the S. Pacific Isls. and Australia, planted occasionally in Calif., and evergreen. **L. Patersonii.** To 50 ft.: lvs. alternate, ovate to oblong, entire, to 4 in. long, thick, gray beneath: fls. pale rose, 2½ in. across, solitary in axils: fr. a caps. splitting into 5 parts.—Propagated by cuttings in spring over heat.

LAGURUS. *Gramineæ.* One ann. grown for ornament in flower-gardens and pots and for dry bouquets, native in Medit. region and nat. in Calif. **L. ovatus.** HARES-TAIL-GRASS. RABBIT-TAIL-GRASS. To 1 ft., soft-pubescent: lvs. to 4 in. long and ⅜ in. wide: spikelets in dense woolly broad heads to 2 in. long, awns ½ in. long. See *Grasses.*

LALLEMANTIA. *Labiatæ.* Ann. or bien. herbs native in Asia, with opposite toothed lvs. and small blue 2-lipped fls. in whorls; sometimes grown in the flower- or rock-garden.

canescens. Bien. to 1½ ft., soft-tomentose: lvs. oblong-lanceolate: fls. blue, 1¼ in. long, the tube much longer than calyx. W. Asia.

iberica. Ann., glabrous: lvs. oblong to linear-lanceolate, nearly entire: fls. blue, the tube included in the calyx. W. Asia.

peltata. Ann. to 1 ft. or more, glabrous or slightly pubescent: lvs. ovate to oblong: fls. blue, the tube scarcely longer than calyx. W. Asia.

pulchella: hort. name.

LAMA: *Maba sandwicensis.*

LAMARCKIA (or *Lamarkia. Achyrodes.*) *Gramineæ.* One tufted ann. of the Medit. region and nat. in Calif., ornamental. **L. aurea** (*Chrysurus cynosuroides*). GOLDEN-TOP. To 1 ft.: lvs. to 6 in. long and ¼ in. wide, soft, glabrous: spikelets awned, in clusters in one-sided glossy panicles to 4 in. long, golden-yellow or purplish. See *Grasses.*

LAMBERTIA. *Proteaceæ.* Australian shrubs with lvs. commonly in whorls of 3, red or yellow fls. solitary or in clusters surrounded by an involucre of colored bracts, and fr. a hard follicle; a few species intro. in Calif.

ericifolia. To 10 ft.: lvs. linear, about ½ in. long, margins revolute: fls. 1½ in. long; inner bracts of involucre ½ in. long.

formosa. Tall shrub: lvs. linear, to 2 in. long, pale beneath, margins recurved: fls. to 2 in. long; inner bracts of involucre to 2 in. long.

multiflora. To 4 ft.: lvs. linear, to 2 in. long: fls. 1½ in. long; inner bracts of involucre ½ in. long.

LAMBKILL: *Kalmia angustifolia.*

LAMB, SCYTHIAN: *Cibotium Barometz.*

LAMBS-EARS: *Stachys lanata.* **-Quarters:** *Chenopodium album.*

LAMIUM. DEAD NETTLE. *Labiatæ.* Ann. or per. Old World herbs with opposite toothed lvs. and 2-lipped fls. in axillary or terminal whorls; grown in the border or rock-garden. Of simple cult. Propagated by division or by seeds.

album. Per., with ascending sts. to 1½ ft. long: lvs. ovate, to 3 in. long: fls. white, 1 in. long. Eu.; nat. in E. U. S.

longiflorum. Per., erect: lvs. ovate-cordate: fls. purplish-red, 1½ in. long. S. Eu.

maculatum (*L. variegatum*). Per., with trailing or ascending sts. to 1½ ft. long: lvs. cordate-ovate, to 2 in. long, often blotched with white along midrib: fls. purple-red, rarely white, to 1 in. long. Eu., Asia; nat. in E. U. S.

Orvala. Per. to 2 ft.: lvs. ovate, to 3 in. long: fls. brown-purple, the tube whitish at base and under lip pink spotted with purple, 1½ in. long. S. Eu.

purpureum. Ann., with decumbent sts. to 1½ ft. long: lvs. ovate, to 1¼ in. long: fls. purple-red, ½ in. long. Eu., Asia; nat. in N. Amer.

variegatum: *L. maculatum.*

LAMPRANTHUS. *Aizoaceæ.* Recent segregate from Mesembryanthemum, from which it differs in bearing marginal wings on capsules and other technical characters: lvs. very narrow: fls. large, mostly brilliantly colored and very showy in sun, among the commonest of the cult. kinds; per. branching plants. S. Afr. For cult, see *Mesembryanthemum.*

aureus (*M. aureum*). Larger and more robust than preceding: lvs. to 2 in. long and ¼ in. broad: fls. golden, 2 in. across.

Brownii (*M. Brownii*). Compact and erect subshrub, 1 ft. high: lvs. terete and fleshy, acute, glaucous-green, to ⅔ in. long: fls. solitary or in 3's, yellowish-red to purplish, to 1½ in. across.

coccineus (*M. coccineum*). Erect and straight, to 3 ft.: lvs. somewhat 3-angled, to 1½ in. long, prominently dotted: fls. scarlet inside and outside.

emarginatus (*M. violaceum*). Erect, to about 2 ft.: lvs. crowded, nearly terete, curved, glaucous, strongly dotted, to 1 in. long: fls. violet, petals twice longer than calyx.

falciformis (*M. falciforme*). To 2 ft., with angled spreading branches: lvs. crowded, acutely 3-angled, falcate, large-dotted: fls. rose, long-peduncled, 1½ in. across.

filicaulis (*M. filicaule*). Sts. filiform and weak, creeping or prostrate: lvs. crowded, subulate, curved, about 1 in. long: fls. reddish, long-peduncled.

glaucoides (*M. aurantiacum*). Erect or base decumbent, to 1½ ft.: lvs. linear and 3-angled, to 1 in. long, glaucous: fls. orange, about 1½ in. across.

glaucus (*M. glaucum*). Erect, 2 ft. or more: lvs. 3-angled and flattened, rough-dotted, glaucous, to 1 in. or more: fls. sulfur-yellow, the petals 1 in. long.

glomeratus (*M. glomeratum. M. roseum*). Subshrubby, with erect slender branches, to 1½ ft.: lvs. linear, green, somewhat incurved, large-dotted, to ¾ in. long: fls. somewhat clustered, reddish-violet, medium-sized.

Haworthii (*M. Haworthii*). Subshrubby, branches erect, to 2 ft.: lvs. semi-cylindric, tapering to either end, glaucous and smooth, to 1½ in. long: fls. purplish, about 3 in. across.

multiradiatus (*M. multiradiatum. M. blandum. M. curviflorum*). Subshrubby, branches spreading, to 2 ft.: lvs. linear, 1 in. or more long, somewhat 3-angled, incurved, glaucous: fls. few together, pale rose, 1½ in. across.

Zeyheri (*M. Zeyheri*). Erect, to 1½ ft.: lvs. much crowded, terete, incurved, smooth and green, to 1½ in. long: fls. solitary, purplish-violet, petals nearly 1 in. long.

LAMPWICK PLANT: *Phlomis Lychnitis.*

LANCEOLATE: lance-shaped; much longer than broad, widening above the base and tapering to the apex.

LANCE-POD: *Lonchocarpus.*

LANDSCAPE-GARDENING, in its original definition, was the making of landscapes to please the imagination by means of gardening designs, practices and materials. With the development of the profession of the high art of landscape subdivision and design the term landscape architecture has come into use, the word architecture being taken in its larger sense of plan or undertaking, and the tendency is to restrict the term landscape-gardening to the horticultural applications; some persons, however, prefer the latter older term to landscape architecture, the word gardening being taken also in its larger sense as the art associated with buildings and the utilization of the personal or domestic property. In this signification landscape-gardening is no more technical gardening than landscape architecture is technical or professional architecture.

In its restricted sense landscape-gardening is the growing and the adapting of plants in the making of grounds, the application of horticultural materials, forms and methods to the development or improvement of landscapes. It may be practiced independently, complete in itself for certain limited areas or purposes, and may also be considered one of the practical means or subordinates in the interpretation of landscape architecture.

The landscape-gardener, in whatever sense the term is taken, may or may not be a practiced propagator and grower of plants, but he must certainly know their artistic values and their adaptations to soils, climates, seasons and settings, and the extent to which they may be associated for the making of pleasing and significant harmonies throughout the year. Every parcel of land under the control of man may derive character and dignity from the proper employment of plant materials. The utilization of such materials to these ends is much more than ornament or than the planting of flowers and showy colored foliage and the making of display: it must have close relation to the essential merits of the area and to the nature of the construction and the setting. The plants are grown not so much for their separate individual merits as for the ways in which they may be adjusted and combined. The landscape-gardener is possessed of an artistic quality, and his appreciation of nature should be as pronounced as is his reaction to garden objects and forms.

The arrangement and design of landscapes constitutes one of the noblest of the arts, deserving keener recognition; and the utilization of plant materials is one of the essential factors in the execution of it.

LANGUAS: *Alpinia speciosa.*

LANTANA. *Verbenaceæ.* Shrubs native in warm regions, having opposite or whorled toothed lvs., small red, orange or white or changeable fls. in dense spikes or heads, and little drupaceous frs.

One (*L. Camara*) is a common florists subject and others may be grown in the South. Plant in a moderate greenhouse and out-of-doors in summer. Propagated by cuttings of soft wood, and also by seeds.

aculeata. To 6 ft., armed with hooked prickles: lvs. ovate to ovate-lanceolate, to 3 in. long: fls. yellow or orange changing to pink or rose. Trop. Amer.

Camara. To 4 ft., sometimes prickly: lvs. ovate, to 5 in. long, rough above: fls. orange-yellow or orange changing to red or white, in flat-topped heads to 2 in. across. Trop. Amer.—Grown under glass and far S., and a bad weed in Hawaii. Several color forms are recognized.

delicatissima: *L. Sellowiana.*

flava of lists is probably a yellow-fld. race of *L. Camara.*

hybrida: a garden name for the dwarf forms of *L. Camara.*

involucrata. To 6 ft.: lvs. ovate, to 1½ in. long, rough above: fls. lilac or white, in small heads subtended by bracts. Trop. Amer.

lilacina. Erect, with 4-angled branches: lvs. ovate to oblong, to 3 in. long, rough above and tomentose beneath: fls. rose-lilac with yellow throat. Brazil.

Sellowiana (*L. delicatissima*). WEEPING or TRAILING L. Shrub with weak vine-like sts. about 3 ft. long: lvs. ovate, 1 in. long: fls. rosy-lilac, in heads 1 in. or more across. S. Amer.—Useful also as a ground-cover far S.

LANTERN-PLANT, CHINESE: *Physalis Alkekengi.*

LAOTHOE: *Chlorogalum.*

LAPAGERIA. *Liliaceæ.* One showy vine from Chile sometimes grown in greenhouses, and out-of-doors in mild climates. **L. rosea.** CHILEAN BELLFLOWER. CHILE-BELLS. Lvs. alternate, ovate, long-pointed, leathery: fls. rose, to 4 in. long, solitary or few together, the perianth-segms. distinct. Var. **albiflora** (var. *alba*) has white fls.—Good drainage and loose soil are necessary and shade from the direct sun. Propagated by layering, cuttings and seeds.

LAPEIROUSIA. *Iridaceæ.* African cormous plants with mostly basal narrow lvs. and red or blue fls. with long or short perianth-tube, blooming in summer.

These plants are hardy in the North with winter protection and grown also under glass for spring bloom. Corms should be lifted and divided every few years.

cruenta (*Anomatheca cruenta*). To 1 ft.: lvs. to 1 ft. long and ½ in. wide: fls. red, the very slender tube to 1½ in. long, in a one-sided spike or raceme.

juncea. To 2 ft.: lvs. to 8 in. long and ¾ in. wide: fls. pale red, the slender tube to ¾ in. long, in loose spikes.

LAPPA: *Arctium.*

LAPPULA (*Echinospermum*). *Boraginaceæ.* Rough-pubescent herbs of the north temp. zone, most of them weedy, with alternate entire lvs., small blue or white fls. in terminal racemes, and fr. of 4 prickly nutlets; scarcely hort. subjects but one listed as a rock-garden plant and a taller one as a general garden subject.

consanguinea. Ann. to 9 in.: lvs. linear-lanceolate: fls. scarcely longer than calyx. Siberia.

floribunda. Bien. or per. to 2 ft. or more: lvs. lanceolate: fls. blue, ¼ in. across. B. C. to Calif. and Minn.

LARCH: *Larix.* **Golden-:** *Pseudolarix amabilis.*

LARDIZABALA. *Lardizabalaceæ.* Chilean evergreen woody vines with ternately compound lvs., staminate fls. in drooping racemes, pisillate solitary, and fr. an oblong berry; sometimes grown in S. Calif. Propagated under glass by cuttings of half-ripened wood.

biternata. Lvs. 1–2-ternate into ovate lfts. to 4 in. long, glossy dark green above: fls. purple-brown, about 1 in. across.

LARDIZABALACEÆ. Lardizabala Family. Woody climbers with compound lvs., unisexual or polygamous polypetalous fls. having mostly 6 petal-like sepals, 6 stamens, often nectaries but no petals, superior ovary of 3 free carpels, and fr. a berry; 8 genera in Asia and Chile. Only Akebia, Decaisnea, Lardizabala and Stauntonia are known in general cult., although *Holboellia grandiflora*, *Sargentodoxa cuneata*, and *Sinofranchetia chinensis* may be grown in botanic gardens.

LARIX. Larch. *Pinaceæ.* Deciduous trees growing to 60 ft. and more, having short linear needle-like lvs. arranged spirally on young shoots and clustered on the short branches or spurs, and spruce-like cones with woody persistent scales, and solitary staminate fls.; native in colder parts of the northern hemisphere and all hardy in climates like the northeastern states. *L. laricina* and *L. Lyallii* become 50–60 ft. high, the others taller. With Pseudolarix and Taxodium, the larches comprise the deciduous members of the Pinaceæ. For cult. see *Conifers.*

americana: *L. laricina.*

dahurica: *L. Gmelini.*

decidua (*L. europæa*). European L. Lvs. to 1½ in. long, obtuse: cones to 1½ in. long. Eu. Var. **pendula** has drooping branchlets.

eurolepis. Dunkeld L. Hybrid between *L. decidua* and *L. Kaempferi.*

europæa: *L. decidua.*

Gmelini (*L. dahurica*). Dahurian L. Lvs. to 1½ in. long, bright green: cones 1½ in. long, with shiny scales. E. Siberia. Var. **japonica** has bluish-red young branchlets. Saghalin, Kurile Isls. Var. **Principis Rupprechtii** has larger cones. N. China, Korea.

Griffithiana. Branches drooping: lvs. obtuse: cones to 4 in. long. S. W. China.

Kaempferi (*L. leptolepis*). Japanese L. Lvs. to 1½ in. long, obtuse, light or bluish-green: cones to 1½ in. long. Japan. Var. **minor** (var. *Murrayana*) is a dwarf form.

laricina (*L. americana*). American L. Tamarack. Hackmatack. Lvs. to 1½ in. long, obtuse, light bluish-green: cones to ¾ in. long, with shiny scales. N. Amer.

leptolepis: *L. Kaempferi.*

Lyallii. Lvs. to 1½ in. long, 4-angled, acute, stiff: cones to 2 in. long, the bracts exserted. B. C. to Mont.

Mastersiana. Lvs. to 1¼ in. long, bright green with 2 pale bands below: cones 1½ in. long, the purple bracts exserted. W. China.

occidentalis. Lvs. to 1¾ in. long, sharp-pointed, stiff: cones to 1½ in. long, the bracts exserted. B. C. to Mont.—Becomes very tall, to 180 ft.

pendula. Hybrid between *L. laricina* and *L. decidua.*

Potaninii. Chinese L. Branchlets drooping: lvs. to 1¼ in. long, 4-angled, acute, grayish-green: cones to 1¾ in. long, the purple bracts exserted. W. China.

sibirica. Lvs. to 2 in. long: cones 1½ in. long. Russia, Siberia.

LARKSPUR: *Delphinium.*

LARREA (*Covillea*). Creosote Bush. *Zygophyllaceæ.* Evergreen balsamiferous shrubs of dry regions with opposite lvs. usually of 2 sessile lfts., yellow solitary terminal fls., and globose white-tomentose frs.

tridentata. To 10 ft., much branched, resinous: lfts. obliquely ovate, ⅓ in. long, 4–5-nerved: fls. ¼ in. long. Mex., Tex. Var. **glutinosa** has lanceolate 3-nerved lfts. Utah to N. Mex.

LASERPITIUM. *Umbelliferæ.* European per. herbs with compound lvs., small white or reddish fls. in large umbels, and cylindrical winged frs.; one species is sometimes grown for ornament.

latifolium. To 5 ft.: lvs. 2-pinnate into oval segms.: fls. white, polygamous, the umbels subtended by short involucral lvs. Cent. Eu.

LASTHENIA. *Compositæ.* Annuals, slightly succulent, native from Ore. to Chile, having opposite entire lvs. and long-stalked heads of yellow ray- and disk-fls.; bracts of involucre united into cup; pappus of scales or none. Sometimes grown in the flower-garden.

californica: *L. glabrata* var.

glabrata. To 1½ ft.: lvs. linear or lanceolate, to 2 in. long, connate at base: heads 1 in. across, June–July. Calif. Var. **californica** (*L. californica*) has lvs. scarcely connate.

LASTREA: *Dryopteris, Polystichum.*

LATANIA. *Palmaceæ.* Three diœcious stout fan-palms of the Mascarene Isls., Indian Ocean, sometimes grown in the open in S. Fla., and frequently planted in the tropics, unarmed except that petioles and lf.-margins are more or less spiny in young plants: lvs. large, heavy and stiff, long-petioled, strongly many-lobed: spadices among the lvs., several ft. long, the staminate bearing many finger-like dense spikes with 15–30 stamens sunken in pits under scales, these ultimate spikes less than 1 ft. long in the first two species and considerably longer in the third; pistillate spadix with many looser-fld. branches or spikes: fr. a hard somewhat drupe-like body 1–2½ in. long, globose, oblong or ovoid and sometimes angled. They are trees, mostly remaining small. For cult. see *Palm*.

aurea: *L. Verschaffelti.*

borbonica of botanists: *L. Commersonii*; of hort., *Livistona chinensis.*

Commersonii (*L. rubra*). To 40 ft., the petioles and ribs of lvs. crimson, the color striking in young plants in which the petioles and lf.-margins are often spiny: petiole 4–6 ft.; blade 5 ft. or more, slightly or not at all glaucous, larger segms. 3 in. or more broad at base on mature lvs.: fr. globose, usually less than 2 in. long, ribbed as also the nut.—A striking plant from the red color.

glaucophylla: *L. Loddigesii.*

Loddigesii (*L. glaucophylla*). Strong grower: petiole 3–5 ft.; blade glaucous-blue, young plants sometimes with reddish tinge, larger segms. under 2 or 3 in. broad: fr. more than 2 in. long, obovoid or pear-shaped, angled; nut with central ridge and smaller ribs above.

rubra: *L. Commersonii.*

Verschaffelti (*L. aurea*). To 40 ft.: petiole 5–8 ft., orange-margined; blade green, segms. usually exceeding 2 in. broad at middle: staminate spikes becoming 1½–2 ft. long: fr. 2 in. long, obovoid, obscurely angled; nut ridged.

LATERAL: on or at the side.

LATHYRUS (incl. *Orobus*). *Leguminosæ.* Vines or erect herbs with pinnate lvs., showy papilionaceous fls. which are solitary or in axillary racemes, and usually flat pods; grown for ornament, and *L. sativus* for the edible seeds; some of them have fragrant fls.

The perennial species are propagated by seeds or cuttings and are of easy cultivation in any soil. The annuals require a deep moist soil and plenty of sunlight. Propagated by seeds in spring. In the South or under glass seed may be sown in the fall for late winter bloom. Ample support should be provided and the seed-pods picked often to lengthen the blooming season.

Aphaca. Climbing to 1 ft.: lfts. oval, hastate at base: fls. yellow, 1–2 on a peduncle. Eu.

articulatus. Ann. to 3 ft., climbing: lfts. linear-lanceolate: fls. rich purple with lilac wings, usually solitary. Medit. region.

azureus: *L. sativus* var. *cæruleus.*

Cicera. Ann. to 2 ft.: lfts. linear-oblong: fls. red, 1–2 on a peduncle. Eu.

Clymenum. Climbing ann. to 3 ft.: lfts. linear-lanceolate: fls. purple-red with blue wings, 2–5 on a peduncle. Medit. region.

Gorgoni. Climbing: lfts. lanceolate: fls. reddish-brown, solitary. Sicily.

grandiflorus. Two-flowered or Everlasting Pea. Per. to 6 ft., climbing: lfts. ovate: fls. rose-purple, large, 2–3 on a peduncle. S. Eu.

hirsutus. Ann. to 4 ft., climbing: lfts. linear-lanceolate: fls. red with paler wings, 1–3 on a peduncle. S. Eu., W. Asia, N. Afr.

lætiflorus. Per. to 8 ft.: lfts. elliptic-lanceolate: fls. nearly white veined with purple, many on a peduncle. S. Calif.

lathyroides: *Vicia oroboides.*

latifolius. Perennial or Everlasting Pea. Per., climbing to 9 ft.: lfts. ovate-lanceolate: fls. rose color, large, several to many on a peduncle. Eu. Var. **albus** and **grandiflorus albus** have white fls. Var. **splendens** has dark purple and red fls.—Common in gardens.

littoralis. Beach Pea. Sts. decumbent: lfts. cuneate-oblong, densely silky-hairy: fls. purple with white wings and keel, 2–6 on a peduncle. Seashore, Wash. to Calif.

luteus (*Orobus luteus*). Per. to 3 ft.: lfts. oblong: fls. bright yellow, in 5–15-fld. racemes. Eu.

magellanicus. Lord Anson Pea. Per. to 5 ft., climbing: lfts. ovate to oblong-linear: fls. violet-blue, 3–4 on a peduncle. Straits of Magellan.

maritimus. Beach Pea. Per. with decumbent sts. to 2 ft. long: lfts. oblong or ovate: fls. purple, in 6–10-fld. racemes. Sea and lake shores, N. Amer., Eu., Asia.

mauritanicus: hort. name.

montanus. Per. with prostrate or upright winged sts. to 1 ft. long: lfts. oblong to lanceolate: fls. purple, greenish at base, in 2–5-fld. racemes. Eu.

niger (*Orobus niger*). Black Vetchling. Per. to 2 ft.: lfts. oval, turning black when dried: fls. purple, in racemes. Eu.

ochroleucus. Per. with trailing or climbing sts. to 2½ ft. long: lfts. ovate: fls. yellowish-white, in 5–10-fld. racemes. Que. to B. C.

Ochrus. Ann., climbing: petioles broadly winged, lfts. oval: fls. yellowish-white, solitary. S. Eu.

odoratus. Sweet Pea. Ann., climbing to 6 ft.: lfts. oval or oblong: fls. of many colors, fragrant, large, 1–4 on a peduncle. Italy. Var. **nanellus**, Dwarf Sweet Pea, is a compact non-climbing form, known in the Cupid. See *Sweet Pea.*

ornatus. Erect per. to 1 ft. or more: lfts. linear: fls. purple, 1 in. long, in 3–5-fld. racemes. S. D. to Wyo. and Okla.

palustris. Marsh Pea. Per. with trailing winged sts. to 3 ft. long: lfts. lanceolate to linear: fls. purple, 2–8 on a peduncle. Moist ground, N. N. Amer., Eu., Asia.

pubescens. Climbing to 6 ft.: lfts. oblong-lanceolate: fls. pale blue, in dense racemes. Chile.

roseus (*Orobus roseus*). Per. to 4 ft.: lfts. oval: fls. rose, 2 on a peduncle. Asia Minor.

rotundifolius. Per. to 5 ft., climbing: lfts. ovate to nearly round: fls. rose-pink, many on a peduncle. Russia, Asia Minor.

sativus. Grass Pea. Ann., 2 ft. and more, nearly erect: lfts. linear: fls. white tinged with blue, solitary. S. Eu. Var. **cæruleus** (*L. azureus*) has blue or blue and white fls.

setifolius. Ann., climbing: lfts. linear: fls. purple or dark red, solitary, small. S. Eu.

spathulata. Sts. ascending: lfts. narrow linear-lanceolate: fls. blue, 5–8 together. Asia Minor.

splendens. Pride-of-California. Per., somewhat shrubby: lfts. ovate-oblong: fls. rose, violet or magenta-red, 6–12 on a peduncle. S. Calif.

superbus: hort. name.

sylvestris. Flat Pea. Per. to 6 ft., climbing: lfts. lanceolate to linear-lanceolate: fls. rose variegated with purple and green, 4–10 on a peduncle. Eu. Var. **Wagneri** has dark red fls.

tingitanus. Tangier Pea. Ann., climbing to 6 ft.: lfts. linear-lanceolate: fls. purple with red wings and keel, 2–3 on a peduncle. Medit region. Var. **roseus** is a color variation.

tomentosus. Somewhat shrubby climber: lfts. linear-lanceolate: fls. blue or violet, 3–4 on a peduncle. Argentina, Brazil.

tuberosus. Per., climbing or trailing to 4 ft., tuber-bearing: lfts. oblong to broadly lanceolate: fls. rose, 3–5 on a peduncle. Eu., W. Asia.—Parts of root tubers are edible.

undulatus. Per. to 3 ft., climbing: lfts. oblong: fls. magenta-red, 5–6 on a peduncle. Turkey.

varius of trade-lists is unidentified.

vernus (*Orobus vernus*). Spring Vetchling. Per. to 2 ft.: lfts. ovate: fls. blue-violet, 5–8 on a peduncle. Eu. Var. **albus** has white fls.

LATTICE-LEAF: *Aponogeton fenestralis.*

LAURACEÆ. Laurel Family. Aromatic trees and shrubs of about 45 genera mostly in warm climates, with commonly alternate simple lvs., small unisexual or bisexual fls. having 6-parted perianth, 12 stamens in series, superior 1-celled ovary, and fr. a drupe or berry. The family yields many ornamental genera and others grown for the edible fr. and spices, as Benzoin, Cinnamomum

Cryptocarya, Hufelandia, Laurus, Litsea, Persea, Phœbe, Sassafras, Umbellularia.

LAUREL: *Laurus*. Alexandrian-: *Danaë racemosa*. California-: *Umbellularia californica*. Cherry-: *Prunus*. Mountain-: *Kalmia latifolia*. Portugal-: *Prunus lusitanica*. Sheep-: *Kalmia angustifolia*. Spurge-: *Daphne Laureola*.

LAURELIA. *Monimiaceæ*. Tall aromatic trees with opposite leathery lvs. and diœcious or polygamous fls. without petals, borne in axillary cymes or racemes; native in Chile and New Zeal., one planted in Calif.

novæ-zealandiæ. To 120 ft., with buttresses at base: lvs. oblong or obovate, to 3 in. long, coarsely toothed, glossy above: fls. ¼ in. across, in racemes to 1 in. long. New Zeal.

LAURESTINUS: *Viburnum Tinus*.

LAUROCERASUS: *Prunus*.

LAURUS. LAUREL. SWEET BAY. *Lauraceæ*. Two trees in the Medit.-Canary region, with alternate simple lvs., small bisexual or unisexual fls. in axillary umbels, and fr. a berry; one species is a common tub-plant, pruned and trained to various shapes.

Laurel withstands several degrees of frost and thrives in spite of neglect. It thrives in rich peaty soil with plenty of moisture. Propagated mostly by cuttings of ripened wood under glass, and sometimes by seeds.

Camphora: *Cinnamomum Camphora*.

glandulifera: *Cinnamomum glanduliferum*.

indica: *Persea indica*.

nobilis. Evergreen tree to 40 ft.: lvs, lanceolate to oval, to 4 in. long, dark glossy green: fls. yellow: fr. black or dark purple. Medit. region; the true laurel of florists.—Variable in stature and leafage; various Latin names are applied as var. **angustifolia, latifolia, salicifolia.**

regalis: a crisped-lvd. form of *L. nobilis*.

LAVANDULA. LAVENDER. *Labiatæ*. Per. aromatic herbs or shrubs with entire, toothed or dissected lvs. and 2–10-fld. whorls crowded into long-stemmed cylindrical spikes, the fls. blue, violet or lilac; native from Canary Isls. to India.

Lavender is propagated by seeds or division, but preferably from cuttings made in late fall or early spring, of the season's growth but with a heel of older wood. In the North winter protection is desirable. The plants are grown for ornament and for the pleasant scent; commonly included among the sweet herbs.

atropurpurea: listed name.

delphinensis: a listed name of doubtful botanical position.

dentata. Sts. somewhat woody: lvs. linear, to 1½ in. long, pinnately toothed, pubescent: fls. deep purple, ½ in. long. Medit. region.

latifolia. Similar to *L. Spica* and often so called, but with broader flat lvs. and linear herbaceous bracts subtending the whorls. Medit. region.

multifida. Bien. to 2 ft., evergreen: lvs. pinnately divided, hoary: fls. lilac. Canary Isls.

officinalis: *L. Spica*.

Spica (*L. officinalis. L. vera*). Subshrub to 3 ft.: lvs. linear to lanceolate, to 2 in. long, entire, the margins revolute, white-tomentose when young: fls. lavender, to ½ in. long, with ovate-pointed bracts at the whorls. Medit. region. Var. **alba** has white fls.

Stœchas. Shrub to 3 ft., gray-tomentose: lvs. linear, ½ in. long, entire: fls. dark purple, in dense spikes with tuft of large purple bracts. Medit. region.

vera: *L. Spica*.

LAVANGA (or *Luvunga*). *Rutaceæ*. A few species of climbing spiny shrubs, India and Malaya to Cochin-China. **L. scandens** is an evergreen sometimes grown for ornament in the citrus belt: lvs. of 3 lfts., petiole not winged: fls. white and fragrant, in axillary clusters: fr. oval or oblong, resinous, yellowish, about 1 in. thick, with lemon-like rind.

LAVATERA. TREE-MALLOW. *Malvaceæ*. Herbs and shrubs widely spread in warm countries, with alternate angled or lobed lvs., often maple-like, and showy fls. solitary in the axils or in terminal racemes.

Lavateras are flower-garden subjects or the shrubby species planted for windbreaks. Of easy cultivation. Seeds should be sown where plants are to stand; perennial kinds are also propagated by cuttings.

Alcea: the plant listed under this name is probably *Malva Alcea*.

arborea. Bien., becoming tree-like shrub to 10 ft.: lvs. orbicular, 5–9-lobed: fls. pale purple-red veined with dark purple at base, 2 in. across, in racemes or clusters. S. Eu.; planted in Calif. Var. **variegata** has mottled lvs.

assurgentiflora. Shrub to 10 ft.: lvs. with 5 coarsely toothed lobes: fls. rose-purple with darker veins, to 2¼ in. across, 1–4 in the axils. Isls. of S. Calif., and planted in that state for windbreaks and ornament.

cachemiriana. Per.: upper lvs. 3–5-lobed, the middle lobe longest: fls. pink, to 1½ in. long, solitary. Himalayas.

Davaei. Ann. or bien. to 4 ft., tomentose: lvs. cordate-ovate, 7-lobed: fls. rose-violet, 2–5 together. Portugal.

insularis. Low shrub: lvs. with 7 coarsely toothed lobes: fls. yellowish striped with purple, 1½ in. long, solitary. Coronado Isls., Lower Calif.

mauritanica. Ann. to 2 ft., densely tomentose: lvs. orbicular-cordate, 5–7-lobed: fls. violet, darker at base. N. Afr.

Olbia. Shrub to 6 ft.: lvs. 3-lobed, the middle lobe longest, or lower lvs. 5-lobed: fls. reddish-purple, 1 in. long, solitary, sessile. S. Eu.

rosea: *L. trimestris*.

splendens: *L. trimestris* var.

trimestris (*L. rosea*). Flower-garden ann. to 6 ft.: lower lvs. nearly round, upper ones angled, toothed: fls. rose or red, 4 in across, solitary. Medit. region. Var. **alba** has white fls. Var. **splendens** is an improved garden strain.

LAVAUXIA: *Œnothera*.

LAVENDER: *Lavandula*: see also *Chrysanthemum Balsamita*. Sea-: *Limonium*.

LAWN. In horticulture a lawn is a close or shaven greensward designed as a foundation setting for buildings or for border planting or for pleasure grounds. It is the outdoor living carpet. If the area is a landscape picture then the lawn is the foreground canvas, the background being the atmosphere and sky. The two essentials to a good lawn are a pleasing surface or contour and a dense firm enduring sod.

The lawn should be made with the idea of permanence. Therefore it is essential that time be taken to grade the land completely and to prepare the ground thoroughly before seeds are sown or plants are set. Earth thrown out from a cellar does not grow a good lawn until it is weathered, fertilized and perhaps other earth or humus added. About a new building or construction the filling should be allowed to settle, so that the finished surface slopes gradually away from the foundations and the steps. If the land is very hard clay, or if the place is rather low, it is well to lay tile underdrains at frequent intervals.

Care should be taken to make the land deep and loose, so that the grass roots may run far into the soil and not be skimped for lack of moisture in a dry time. If the land has not had applications of manure in recent years, it is well to plow in, or to spade in, a liberal quantity of well-rotted litter or similar material. Work this into the ground as deeply as possible. If the hardpan is rather high, it is well to subsoil the area or to trench it (that is, to spade it up two or three spades deep). If the land is apparently not fertile in plant-food, it is well to add a dressing of commercial fertilizer to the surface when the grass seed is sown; the fertilizer should provide nitrogen, phosphoric acid, potash, in approximately the proportions 4–10–4, and 15–20 pounds to 1,000 square feet is a good application. This starts the grass quickly and allows it to get a foothold before the severe weather of midsummer.

Many kinds of grass are employed in the making of lawns. Much depends on the region and also on the personal taste of the owner. There are good commercial mixtures. The standard lawn grass is june-grass or Kentucky blue-grass (*Poa pratensis*). The seeds of this grass are sold in the hulls, and therefore the bushel weighs only 14 pounds. Not less than 2½ to 3 bushels should be sown to the acre. In the southern states, june-grass will not hold, and Bermuda-grass is used, being sown about as thick as recommended for the june-grass; and far south St.-Augustine-grass, centipede-grass and carpet-grass are employed. The june-grass alone gives an excellent lawn in a very short time. Whether one shall sow white clover in the lawn depends mostly on personal taste. If one likes white clover, it is well to put in a quart or two of seed to the acre, sowing it separately from the june-grass to insure even distribution. It thrives where the land is rather moist. In parts of the East, Rhode Island bent-grass is sometimes used for lawns. Red fescue is good for shady places. Other fescues, English rye-grass, and redtop are also employed.

Grass seed should be sown in the cool of the year. The lawn may be seeded in September and the plants thereby become established before winter; or seed may be sown very early in the spring. In newly made lawns, it is a good plan to grade the area thoroughly in autumn, allowing it to settle in the winter in the North; and then, if the surface remains even, to sow the grass seed on one of the late snows in spring. By sowing it on the snow, one can see that it is distributed evenly; and when the snow melts, the seed is carried into the land and does not need covering. It is well to sow 3 or 4 quarts to the acre of timothy seed, for the timothy germinates very quickly and makes a green area the first season, but is killed out as soon as the june-grass gains a foothold. Timothy will not stand the continued cutting and the crowding. The timothy, therefore, serves as a temporary covering, indicating where the borders are and thereby outlining the area for the lawn-mower to cut. The timothy seed should be sown separately from the june-grass to make even distribution. On hard lands it is well to sow 2 or 3 quarts to the acre of crimson clover seed. The long roots of this plant tend to improve the physical condition of the soil; and when they decay they leave nitrogen for the grass to use. As crimson clover is annual, it will not do any permanent mischief in the lawn unless it is allowed to go to seed and become weedy.

Weeds will probably come up thickly the first season if the land is rich. These weeds should not be pulled, for whenever one is pulled out of the ground many grass plants are rooted up and the surface is made uneven. The only way to keep down weeds is to mow them frequently with a lawn-mower. They will not appear in any great numbers the second year, unless there should be perennials, as dandelion or dock; and these may be cut out the first autumn or the following spring. The permanent remedy for weeds is to obtain a better stand of grass; and one should make sure that the land is clean to begin with and that the grass seed is also free of weeds.

Seldom does one secure a perfectly good and uniform sod from one sowing; particularly is this true if the soil varies in different parts of the area. If the surface contour is satisfactory, it is unwise to dig up the areas on which the seed has not caught. It is best to rake them over with a steel rake in fall or spring, applying a little chemical fertilizer rather rich in nitrogen, and sow more seed. Nearly every lawn will need patching in this way from year to year. If the lawn is attended to in fall and spring by sowing grass seed, the weeds will rarely do serious mischief. When weeds are troublesome on the lawn, it means that there is not sufficient grass. If narrow-leaved plantain bothers, it is an indication that the land is too poor and dry for grass. In such cases, the land usually lacks humus or vegetable matter; and in various severe incursions of the plantain, it may be necessary to spade up the weedy areas and to work rotted manure into the soil. Usually, however, the plantain can be killed by enriching the soil and sowing more grass seed.

In spring the lawn should be cleaned of refuse, thoroughly rolled, low spots and hummocks levelled, and again fertilized. It is well to apply part of the fertilizer in autumn, that it may get well into the earth before growth starts; and if trees and bushes stand on the lawn, an extra allowance of fertilizer should be provided.

In dry times the lawn may be watered; but the common practice of sprinkling lawns is usually injudicious, since the water is not supplied in sufficient amount to wet down very far, and the grass tends to make surface roots; then when the watering is omitted the plants suffer. The more a lawn is sprinkled, the more the grass depends on the sprinkling. If it is necessary to wet the lawn, the water should be allowed to run directly from the hose until the surface area is completely soaked, or merely break its force so that it will not wash away the surface or compact the area. It is best to do this at nightfall. When the water is applied by means of a sprinkler, a large part of it may evaporate. The fundamental treatment of the lawn is to have the land so deep and porous that the grass roots strike deep into the soil and do not need the surface water. A well-made lawn needs watering only in unusually dry times, unless there are many trees.

The lawn should be mown frequently when it is growing rapidly,—in spring and early summer. In autumn mow less frequently, and let it go into the winter with a good coat of grass. If the lawn is mown as often as is needed, it will not be necessary to rake off the trimmings. In autumn, top-dress the lawn with commercial fertilizer, as already advised, at the rate of 500 pounds to the acre. If it has not been raked clean of all the trimmings and decayed refuse which covers the surface, it is not necessary to dress it with stable-manure; for manure is unsightly, unsavory, and often brings in weeds. The heavy leaf-fall from trees should be raked off, but the last thin drop may be allowed to remain for protection. Many persons make the mistake of raking the lawn clean at the approach of winter.

Sodding rather than seeding is sometimes employed for the making of a lawn, particularly when quick results are desired. This is also a good means of securing the margins of walks and drives and of outlining small subdivisions. Unless the sod is of the right kind, however, and very carefully laid, the results are not good. Sod adapted to the work is that which comes from an old closely grazed pasture. Sod from a sheep pasture is supposed to be specially good. Such sod has been so closely grazed that it has made a dense close mat, and all the weeds have been destroyed. The droppings of the animals also make the ground fertile. The sod should be cut in thin strips, not more than 1½ or 2 inches in thickness. If it is thicker than that it is heavy and bulky to handle, and is not so easily laid. Ordinarily, the sod is cut in strips 10 inches or a foot wide. A board is laid on the sod and the strip is cut along either side of it with a sod-cutter or a sharp spade. Two men then roll up the sod. One stands on the strip of sod with his face toward the man who, with the spade, cuts it loose beneath. As it is cut loose, the man on the strip rolls the sod toward him so that the upper surface is on the inside of the roll. Strips longer than 10 or 12 feet make rolls too heavy to handle with ease.

The sod should be pounded down firmly and evenly, and the ground on which it is laid should, therefore, be freshly worked and loose. A heavy pounder should be used, as a block of wood. It is usually impossible to pound down sod with the back of a spade sufficiently firm unless the earth is very mellow. The sod should be pounded until the top is about level with the surrounding surface. This insures contact with the soil beneath, so that there are no air spaces and no likelihood of drying out. Sod pounded down as firmly as this should grow readily. Water the area if the season or soil is dry. If a sod edging is laid along walks and drives, it should be pounded down an inch or more lower than the surrounding loose land which is seeded, because the loose land will finally settle; otherwise the sod border is likely to be higher than adjacent land after a year or two. If there are uneven shallow places on the sodded area, the depressions may be filled with very loose fine earth, and the grass will grow through it. In dry weather, a newly sodded area may be mulched with a half inch or less of fine loam to protect it.

Another kind of sodding may be mentioned. In some cases, extra good sod, particularly that grown for the purpose of lawn-making, is cut into small pieces and practically sown on the land, no effort being made to cover the surface continuously. These pieces soon establish themselves, spread, and grow together, covering the area as if it were seeded. They should be rolled firmly.

Ground-cover of other kind than grass is often necessary, as in shade and under certain kinds of trees. Keep the eyes open for native and spontaneous ground-covers. Usually nature covers the bare spots, in countries of liberal rainfall. Old cemeteries and other neglected properties are likely to yield useful suggestions. Here one is likely to find cypress-spurge, santolina, and other hardy things run wild or long-established. The periwinkle or ground-myrtle (*Vinca*) is one of the best covers for shade; it is hardy, glossy-leaved, evergreen, dense, and has blue flowers in spring. The common woods blue violet (as *Viola papilionacea*) makes an excellent marginal cover and takes care of itself. Lily-of-the-valley thrives in shade and holds its foliage till autumn. Moneywort and ground ivy (*Lysimachia Nummularia* and *Nepeta hederacea*) make dense covers, invading even shady corners; they are likely to become weeds, however, and one must be on guard. The true or English ivy allowed to run on the ground provides a complete evergreen cover where it is hardy. The Japanese pachysandra is another good evergreen cover plant. The native woodsy hog-peanut (*Amphicarpæa*) makes a deep cover on the shady side of a building. Woods ferns are to be considered. Where fully hardy, Japanese honeysuckle (*Lonicera japonica*) makes a heavy covering but in the South is a pest. The introduced coltsfoot or tussilago, although somewhat weedy, makes a better appearance than banks of gravel and rubbish. The clumps of hosta also persist well in shade. *Mazus japonicus*, available of nurserymen, as also certain of the carpeting sedums, make interesting covers in shade. Other plants to be mentioned for shady spots are woodruff (an asperula), wild ginger (asarum), the somewhat weedy creeping commelinas (*C. communis* and *C. nudiflora*), the running native dichondra. The lily-turfs may be employed for ground-cover, particularly South, as well as lippia and the small lantana. Other ground-cover plants are galax, yarrow (when not allowed to bloom), sedums, creeping thyme, ajuga, certain prostrate veronicas, *Dianthus deltoides*, wintergreen, rock-rose, herniaria, partridge-berry, and a number of prostrate evergreen shrubs.

In courts and similar places, flat stones may be used to advantage as a ground-cover with liberal spaces between for grass. This lends a personal touch to the premises, and the moisture held by the stones may support greenery where otherwise it might not persist.

Another kind of requirement is to find a way of covering garden beds that have spent their vegetation in early autumn. If one wants temporary greenery for the autumn and open days of winter, one may sow winter wheat, or winter oats farther south, digging it up or spading it under in spring.

LAWSONIA. *Lythraceæ.* One shrub, native probably in Afr. and Asia, now widely distributed in warm countries, grown for ornament and also yielding henna dye. **L. inermis.** Henna. Mignonette-Tree. To 20 ft.: lvs. opposite, elliptic, to 1½ in. long: fls. small, very fragrant, in many-fld. terminal panicles, from white to rose and cinnabar-red as indicated by the varietal names **alba** and **rubra**: fr. a small caps.—Propagated by seeds and cuttings.

LAYERS: see *Propagation.*

LAYIA. *Compositæ.* Low and early annuals with alternate entire or pinnately lobed lvs. and solitary terminal heads of yellow or white ray- and disk-fls. in spring or early summer; pappus of scales or bristles or none; native in W. N. Amer. Of easy cult. in the flower-garden. Propagated by seeds sown in the open or started indoors.

Calliglossa (*Calliglossa* and *Callichroa Douglasii*). To 1 ft., nearly glabrous: lvs. to 3 in. long: rays yellow tipped white; pappus of awns. Calif.

chrysanthemoides (*Oxyura chrysanthemoides*). To 14 in., slightly pubescent: lvs. oblong, to 2 in. long: rays yellow tipped white; pappus none. Calif.

elegans. Tidy Tips. To 2 ft., diffusely branching, hairy: lvs. linear, to 3 in. long: rays to ¾ in. long, yellow often white tipped; pappus of hairs and bristles. Calif. Var. **alba** has all white rays.

glandulosa. White Daisy. To 1½ ft., simple or diffusely branched, hairy and glandular: lvs. lanceolate or linear, 1¼ in. long: heads 1½ in. across, rays white or sometimes tinged rose; pappus of white hairs and scales. B. C. to Ida. and Mex. Var. **heterotricha** (*L. heterotricha*), to 2 ft., rough-hairy.

heterotricha: *L. glandulosa* var.

platyglossa (*Callichroa platyglossa*). To 16 in., hairy and glandular: lvs. linear: heads to 1¾ in. across, rays yellow tipped white; pappus of bristles. Calif.

LEAD-PLANT: *Amorpha canescens.*

LEADWORT: *Plumbago.*

LEAFLET: one part of a compound leaf; secondary leaf.

LEAF-STALK: the stem of a leaf; petiole; footstalk.

LEATHER-JACKET: *Eucalyptus punctata.*

LEATHER-LEAF: *Chamædaphne calyculata.*

LEATHER-ROOT: *Psoralea macrostachya.*

LEATHERWOOD: *Cyrilla racemiflora, Dirca.*

LEBBEK-TREE: *Albizzia Lebbek.*

LECYTHIDACEÆ. Lecythis Family. Trop. trees or shrubs in both hemispheres, of 18 genera with large alternate simple lvs., regular bisexual polypetalous fls. of striking appearance, having 4–6 sepals and petals, numerous stamens and often a large disk, inferior 2- or more-celled ovary: fr. various, often a large woody caps. or body opening by a lid and known as "monkey pot." Known to hort. chiefly in the Brazil-nut, Bertholletia, and in Barringtonia. Allied to Myrtaceæ.

LEDUM. *Ericaceæ.* Evergreen low shrubs with alternate entire lvs., small white fls. in terminal clusters in spring, and capsular frs.; native in cold parts of the northern hemisphere in sphagnum bogs and damp places, suitable for evergreen borders.

They succeed in sandy peaty moist soil. Propagated by seeds in spring, by layers and division. Plants may also be transplanted from the wild.

columbianum. To 3 ft.: lvs. oblong, to 2½ in. long, whitish and glandular beneath, slightly revolute. Wash., Ore.

decumbens: *L. palustre* var.

grœnlandicum (*L. latifolium*). Labrador-Tea. To 3 ft.: lvs. oblong, to 2 in. long, rusty-tomentose beneath. N. N. Amer. Var. **compactum** is a dwarf form.

latifolium: *L. grænlandicum.*

palustre. Crystal-Tea. Wild Rosemary. To 3 ft.: lvs. linear or linear-oblong, to 1½ in. long, rusty-tomentose beneath. N. Eu., N. Asia. Var. **decumbens** (*L. decumbens*) is a decumbent form with small linear lvs. N. Amer., N. Asia.

LEEA. *Vitaceæ.* Shrubs or small trees, not climbing, native in trop. Asia and Afr., with alternate pinnate lvs., fls. in cymes, and fr. a berry; grown as foliage plants in the greenhouse. They succeed in light loam or peaty soil. Propagated by cuttings.

amabilis. Lvs. of 5–7 lanceolate toothed lfts., bronzy-green with white veins and broad white stripe. Borneo. Var. **splendens**, st. red, lvs. variegated with bright red.

sambucina. Lvs. 2–3-pinnate, lfts. toothed, tinged with bronze and with rosy veins. Trop. Asia and Australia.

LEECHEE: *Litchi chinensis.*

LEEK (*Allium Porrum*). An onion-like plant, very hardy, grown in the vegetable-garden for eating. The leek is used in cookery, the soft bulb and leaves being employed. It is milder than the onion, and the flavor is distinct. The plant is not known truly wild, and is supposed to be a development from another species of Europe and western Asia. For relationships, see *Onion.*

Leek is a long-season plant. Seeds sown in spring give edible plants for late autumn, winter and spring. Usually the rows or drills are hilled up somewhat to blanch the lower part of the plant. Leeks may stand 4–6 inches apart in the row; for best results, they should be transplanted to this distance from a seed-bed. Plants may be lifted before hard weather and stored in the cellar like celery, and in many parts of the country they are left in the ground all winter.

LEGUME. Technically, the fruit or pod characteristic of the Leguminosæ, well represented in the garden pea. It is a simple pistil, dehiscent or splitting on both edges or sutures. Many of the pods in the Leguminosæ do not conform in all things to the ideal or pattern structure; some of them are indehiscent. As a general agricultural term, a legume is a plant of the Leguminosæ, as clover, vetch, beans, peas, locust. In French horticultural writing it is a garden vegetable or pot-herb.

LEGUMINOSÆ. Pea or Pulse Family. A very large family, of about 500 widely distributed genera and several thousand species, furnishing many economic, food and forage plants and numerous ornamental subjects; the family characters are varied but all genera produce a leguminous fr. or true pod; the most familiar section of the family in northern regions is that with papilionaceous or butterfly-like (pea-like) fls. and stamens 10 of which 9 are more or less united into a tube: this section is sometimes separated as Fabaceæ, other sections of the general family being segregated as Cæsalpiniaceæ and Mimosaceæ.

Genera entered here are Abrus, Acacia, Adenanthera, Adenocarpus, Agati, Albizzia, Amherstia, Amicia, Amorpha, Andira, Anthyllis, Apios, Arachis, Astragalus, Baphia, Baptisia, Barklya, Bauhinia, Bolusanthus, Bossiæa, Brachysema, Brownea, Cæsalpinia, Cailliea, Cajanus, Calliandra, Calophaca, Calpurnia, Calycotome, Camoensia, Campylotropis, Canavalia, Caragana, Carmichælia, Cassia, Castanospermum, Centrosema, Ceratonia, Cercidium, Cercis, Chorizema, Cicer, Cladrastis, Clianthus, Clitoria, Colutea, Colvillea, Coronilla, Crotalaria, Cytisus, Dalbergia, Dalea, Daubentonia, Delonix, Derris, Desmanthus, Desmodium, Detarium, Dillwynia, Dioclea, Dolichos, Dorycnium, Ebenus, Enterolobium, Erythrina, Eutaxia, Flemingia, Galega, Genista, Gleditsia, Gliricidia, Glycine, Glycyrrhiza, Gompholobium, Goodia, Gourliea, Gymnocladus, Hæmatoxylon, Halimodendron, Hardenbergia, Hedysarum, Hippocrepis, Hosackia, Hovea, Hymenæa, Indigofera, Inga, Kennedia, Krameria, Laburnocytisus, Laburnum, Lathyrus, Lens, Lespedeza, Leucæna, Lonchocarpus, Lotus, Lupinus, Maackia, Medicago, Melilotus, Mimosa, Mucuna, Myrospermum, Myroxylon, Olneya, Onobrychis, Ononis, Ormosia, Ornithopus, Oxylobium, Oxytropis, Pachyrhizus, Parkinsonia, Parochetus, Peltophorum, Petalostemon, Petteria, Phaseolus, Piptadenia, Piptanthus, Pisum, Pithecellobium, Platymiscium, Podalyria, Poinciana, Pongamia, Prosopis, Psophocarpus, Psoralea, Pueraria, Pultenæa, Rhynchosia, Robinia, Samanea, Saraca, Schizolobium, Schotia, Schrankia, Scorpiurus, Securigera, Sesbania, Sophora, Spartium, Stizolobium, Strombocarpa, Sutherlandia, Swainsona, Tamarindus, Templetonia, Tephrosia, Thermopsis, Tipuana, Trifolium, Trigonella, Ulex, Vicia, Vigna, Virgilia, Wisteria.

LEIOPHYLLUM (*Dendrium*). Sand-Myrtle. *Ericaceæ.* N. American low compact evergreen shrubs with small entire lvs., small white or pink fls. in terminal corymbs in spring, and capsular frs.

Suitable for borders and rock-gardens where they should be given a peaty or sandy loam soil. Propagated by seeds in a coldframe and by layers.

buxifolium. Box S. To 2 ft., much branched: lvs. mostly alternate, ⅛ in. long: pedicels glabrous. N. J. to Fla. in sandy soil; hardy N.

Lyoni (*L. buxifolium* var. *prostratum*). Allegheny S. Prostrate, densely branched: lvs. mostly opposite, ¼ in. long: pedicels pubescent. Mts., N. C. and Tenn.

LEMAIREOCEREUS. *Cactaceæ.* Large and tree-like or shrub-like mostly columnar and branching cacti of the Cereus group, rarely low or nearly prostrate, spines commonly many and stout: fls. mostly diurnal, of medium size, bell-shaped or somewhat funnelform and not widely expanded, white to pink: fr. at first covered with spines: Ariz. and Cuba to Venezuela and Peru. Many of the species are planted in the tropics for the edible fr., but are little known in the U. S. outside collections of institutions and fanciers. See *Cacti.*

Dumortieri (*Cereus Dumortieri*). Mostly tree-like, to about 50 ft., but trunk not much exceeding 3 ft. and 1 ft. diam., branches erect and with many constrictions, bluish, ribs usually 6, radial spines 10–20, centrals 1 or more: fls. 2 in. long, white. Cent. Mex.

eburneus: *L. griseus.*

eruca: *Machærocereus eruca.*

griseus (*Cereus eburneus*). To 20 or 25 ft., sometimes branching from base and sometimes with trunk 1 ft. diam., ribs 8–10, spines needle-like: fls. nearly 3 in. long, pinkish. Trinidad and other isls., Venezuela.

gummosus: *Machærocereus gummosus.*

stellatus (*Cereus stellatus*). To 6 or 10 ft., branching mostly at base, bluish-green, ribs 8–12, radials 10–12, centrals several and mostly longer: fls. about 1½ in. long, narrowly bell-shaped, red. S. Mex.

Thurberi (*Cereus Thurberi*). Commonly branching from base, branches often many and to 20 ft. or more and 8 in. diam., ribs 12–17, areoles becoming waxy, spines many and needle-like to awl-like: fls. to 3 in. long, diurnal, light purple with white margins. S. Ariz., Mex.

Weberi (*Cereus Weberi*). To 30 ft. or more and often with hundreds of erect branches, ribs mostly 10, radials usually 6–12, central long and solitary: fls. to 4 in. long, white. Mex.

LEMNA. Duckweed. *Lemnaceæ.* Minute floating per. or over-wintering herbs with a disk-shaped green leaf-like thallus that bears 1 rootlet and minute monœcious fls. consisting of only a stamen or a pistil; grown in ponds as a food for fishes. Plants fall to the bottom of the pond in autumn but rise again in the spring.

minor. Thallus to ¼ in. long, ovate or orbicular. Cosmopolitan.—Sometimes grown on the surface of aquaria and pools, and more than one species or genus may be involved in such collections, as Spirodela in which the roots are several.

LEMNACEÆ. Duckweed Family. Represented in hort. only by the genus Lemna.

LEMON: *Citrus Limonia:* see *Citrus Fruits* (page 156). **-Vine:** *Pereskia aculeata.* **Water-:** *Passiflora laurifolia.*

LENS. *Leguminosæ.* Herbs with pinnate lvs., the terminal lft. modified into a tendril or short bristle, small whitish papilionaceous fls. solitary or few together in the axils, and flattened pods.

One species is widely cultivated abroad as a cheap and nutritious source of food and the vines are sometimes utilized as forage. Propagated by seeds sown in drills in early spring.

esculenta. Lentil. Ann. to 1½ ft.: lvs. with small lfts. and ending in a tendril: pods broad, to ¾ in. long. S. Eu.

LENTIBULARIACEÆ. Bladderwort Family. Aquatic or marsh herbs of wide distribution, of 5 genera or as recently subdivided of about 16 genera: lvs. very diverse: fls. bisexual and irregular, with 2–5-lobed calyx, gamopetalous 2-lipped corolla often spurred, 2 stamens, superior 1-celled ovary: fr. a dehiscent caps. A few genera are grown in moist places and water-gardens, as Pinguicula and Utricularia.

LENTIL: *Lens esculenta.*

LEONOTIS. Lions-Ear. *Labiatæ.* S. and trop. African ann. and per. herbs or shrubs with white, yellow or orange 2-lipped fls. in dense axillary whorls; grown outdoors in S. Fla. and Calif. and in the greenhouse for winter bloom.

In the North cuttings should be made in early spring, the young plants grown in the open during the summer but frequently pinched to secure a symmetrical growth. If the plants do not bloom before frost, they may be cut back when they are lifted, placed in a cool greenhouse and will flower in November or December. They may also be grown from seed.

dubia. Per. to 3 ft.: lvs. cordate-ovate, to 2½ in. long, toothed, pubescent beneath: fls. orange-yellow, 1½ in. long.

dysophylla. To 2 ft., shrubby: lvs. ovate-lanceolate, to 3 in. long, toothed, densely yellow-hairy: fls. orange-yellow, to 1½ in. long.

laxifolia. Per.: lvs. broad-ovate, to 4 in. long, toothed, slightly pubescent: fls. orange-yellow, 1⅓ in. long, the whorls loosely fld.

Leonurus. Per. to 6 ft.: lvs. lanceolate, 2 in. long, toothed, pubescent: fls. showy, red-yellow or orange-red, in one form white, to 2 in. long, densely hairy.

LEONTODON TARAXACUM: *Taraxacum officinale.*

LEONTOPODIUM. *Compositæ.* Low herbaceous tufted and woolly perennials with entire basal or alternate lvs. and small discoid heads crowded into terminal dense cymes, the subtending bracts often conspicuous and corolla-like; pappus of bristles; native in the mts. of Eu., Asia and S. Amer.

One species, the edelweiss, is grown in the rock-garden or sometimes indoors in pots. It requires deep gritty or sandy loam as the roots travel far. Propagated by division of the old plants, wintering them in a coldframe. When seeds are sown about the first of February, by late spring the plants are large enough to be set in their permanent quarters.

alpinum (*L. himalayanum. Gnaphalium Leontopodium*). Edelweiss. To 1 ft., white-woolly, creeping by rootstocks: lvs. oblong-lanceolate: heads surpassed by very woolly narrow floral lvs. or bracts. High mts., Pyrenees, Alps, Cent. Asia.

himalayanum: *L. alpinum.*

sibiricum. Differs from *L. alpinum* in the oblong-linear often webby lvs. and heads nearly twice as large. Russia.

LEONURUS. Motherwort. *Labiatæ.* Herbs native in Eu. and Asia, usually more or less weedy, with opposite toothed or divided lvs. and small white or pink fls. in dense axillary whorls; sometimes grown in the flower-border. Easily raised from seeds.

Cardiaca. Per. to 5 ft.: lower lvs. to 4 in. across, palmately 3–5-parted, upper oblong-lanceolate, divided or toothed: fls. ⅓ in. long, white-woolly outside. Eu., Asia.; nat. in N. Amer.

glaucescens. Similar to *L. Cardiaca* but glaucous and with more deeply cut narrower floral lvs. Siberia.

sibiricus. Ann. or bien. to 6 ft.: lvs. to 4 in. long, deeply 3–parted into ovate or lanceolate toothed segms.: fls. red or purple, to ½ in. long, pubescent outside. E, Asia; nat. in N. Amer.

LEOPARD-PLANT: *Ligularia Kaempferi* var. *aureo-maculata.*

LEOPARDS-BANE: *Doronicum, Senecio Doronicum.*

LEPACHYS (*Ratibida*). Coneflower. *Compositæ.* N. American mostly per herbs with alternate pinnately divided lvs. and solitary heads of yellow ray-fls. and brown globose or cylindric disks; pappus of teeth or none. Grown in the flower-garden or sometimes as ann. bedding plants. Propagated by seed.

columnaris. To 2½ ft., rough-hairy: lf.-segms. linear: rays yellow, 1 in. or more long, disk columnar. Minn. to Mex. Var. **pulcherrima** (*Obeliscaria pulcherrima*), rays partly or wholly brown-purple.—There is a double-fld. form, making an attractive oblong or nearly globular head.

pinnata. To 5 ft., rough-hairy: lf.-segms. lanceolate: rays yellow, to 3 in. long, disk oblong. Ont. to Fla. and La.

LEPADENIA: *Euphorbia marginata.*

LEPARGYREA: *Shepherdia.*

LEPIDIUM. Pepper-Grass. *Cruciferæ.* Ann., bien., per. herbs of widespread distribution largely in temp. regions, some of them subshrubby, many of them weedy, one long known as a piquant salad plant: erect more or less branching, glabrous or pubescent: lvs. various, mostly long rather than broad and dentate to pinnatifid: fls. very small, white or greenish, in terminal racemes: fr. a short broad pod or silicle.

sativum. Garden Cress. Glabrous ann., more or less glaucous, to 2 ft.: basal lvs. pinnatifid and toothed, on st. becoming linear and entire. W. Asia; somewhat escaped in N. Amer.—Some cult. forms have curled and crispate lvs. Sometimes called "Upland Cress" in distinction from water-cress, but that name belongs rather with Barbarea. See *Cress.*

LEPTANDRA: *Veronicastrum virginicum.*

LEPTASEA: *Saxifraga.*

LEPTINELLA: *Cotula. L. squarrosa* is a listed name.

LEPTOCHLOA. *Gramineæ.* Ann. or per. grasses with flat lvs. and spikelets in slender racemes forming a long panicle; native in warm and temp. parts of the world; one sometimes raised for ornament. See *Grasses.*

fascicularis (*Diplachne fascicularis*). Spike-Grass. Tufted per. to 2½ ft.: lvs. to 8 in. long and 1/12 in. wide, rough: panicles to 1 ft. long, branches erect or ascending. Fla. to Tex. and Mo., W. Indies, Mex., S. Amer.

LEPTODACTYLON. *Polemoniaceæ.* Per. leafy herbs or subshrubs with alternate or opposite palmately divided lvs. and pink to white salverform fls.; differs from Gilia chiefly in the shrubby habit. Of easy cult. in mild climates.

californicum (*Gilia californica*). Shrub to 3 ft.: lvs. palmately divided into 5–9 rigid linear lobes ⅓ in. long: fls. rose or lilac, 1½ in. across, in few-fld. clusters. Calif.

LEPTODERMIS. *Rubiaceæ.* Deciduous shrubs from Asia, with opposite entire lvs., tubular 5-lobed fls. in axillary head-like clusters, and capsular frs.; one species is fairly hardy in the N. Propagated by cuttings of green wood in summer and by seeds.

oblonga. To 4 ft.: lvs. oval to oblong, to ¾ in. long: fls. violet-purple, ½ in. long, July–Oct. China.

LEPTOPTERIS. *Osmundaceæ.* Ferns with dark green lvs. clustered at top of stout rhizome, 2–3-pinnate into small linear segms.; sori on under surface of lf.; native Australia, New Zeal. and Pacific Isls., and sometimes planted in warm countries.

hymenophylloides (*Todea hymenophylloides*). Lvs. to 2½ ft. long and 1 ft. broad, on stalks to 1 ft. long. New Zeal.

superba (*Todea superba*). Lvs. to 4 ft. long and 10 in. broad, on stalks to 4 in. long, the lower pinnæ gradually reduced in size. New Zeal.

LEPTOPYRUM. *Ranunculaceæ.* One ann. herb native in Cent. Asia and sometimes planted in the garden for its fine foliage and fls. **L. fumarioides** (*Isopyrum fumarioides*). Erect or much spreading, to 6 or 8 in high, smooth: lvs. whorled on st., also radical, decompound: fls. white, with 4–5 petal-like sepals and many nectaries, about ⅛ in. across.

LEPTOSIPHON: *Linanthus.*

LEPTOSPERMUM (*Fabricia*). *Myrtaceæ.* Shrubs or small trees native in Australia, New Zeal. and Malaya, having alternate simple lvs., white or pink or red fls. solitary or 2–3 together, and fr. a leathery caps.

Leptospermums are planted out-of-doors in the South, particularly in California, and sometimes in the greenhouse. *L. lævigatum* is extensively employed for the reclamation of moving sands. In the greenhouse plants should be kept cool till February or March and then given a temperature of 55–60°. Propagated by seeds in spring, cuttings under glass in May, or mature cuttings in autumn. They make excellent shrubbery in regions where hardy.

Chapmannii: *L. scoparium* var.

ericoides. To 60 ft.: lvs. to ½ in. long, acute: fls. to ¼ in. across, borne profusely. New Zeal.

flavescens. Tall shrub: lvs. usually ½ in. or less long, obtuse: fls. white, about ½ in. across. Australia.

flexuosum: *Agonis flexuosa.*

lævigatum. Australian Tea-Tree. To 30 ft.: lvs. to 1 in. long and ½ in. broad, obtuse: fls. white. to ¾ in. across. Australia. Var. **variegatum** is listed.

lanigerum: *L. pubescens.*

Nichollii: *L. scoparium* var.

pubescens (*L. lanigerum*). Tall shrub or tree, often woolly or silky: lvs. usually ½ in. and less long, obtuse: fls. white, to ¾ in. across. Australia.

scoparium. To 18 ft. or sometimes 25 ft., or in dwarf forms only a ft. or two, young parts silky: lvs. ½ in. or less long, acute: fls. white, to ½ in. across, among the foliage. Australia, New Zeal. Very variable. Var. **bullatum** has larger lvs. and fls. Var. **Chapmanii** has bright rose fls. and brownish lvs. Var. **juniperinum** has narrow lvs. and drooping branchlets. Var. **Nichollsii** has bronzy lvs. and carmine fls. (Name first published *Nichollii* but subsequently corrected).

spinescens. Stiff shrub with spiny branchlets: lvs. to ½ in. long, obtuse: fls. solitary. W. Australia.

LEPTOSYNE. *Compositæ.* Ann. and per. glabrous herbs or subshrubs, some of them very fleshy, with mostly alternate lvs. divided into narrow segms., and bright yellow long-stalked heads of ray- and disk-fls.; native to S. W. U. S. Although still kept distinct by horticulturists, largely because of the succulent nature of some of the kinds, Leptosyne is by botanists included in Coreopsis, where the consultant may look for the names *californica* (*C. Douglasii*), *calliopsidea*, *Douglasii*, *gigantea*, *maritima*, *Stillmanii*. The succulent feature does not hold uniformly and the technical characters do not really separate the group from Coreopsis.

LEPTOTES. *Orchidaceæ.* Terrestrial or epiphytic orchids with stem-like pseudobulbs with thick lvs. and fls. in 1–3-fld. terminal infl., the sepals and petals nearly equal, the lip 3-lobed; for cult. see *Orchids.*

bicolor (*Tetramicra bicolor*). Lvs. to 3 in. long: fls. solitary, white with rose-colored lip, Jan.–Mar. Brazil, Paraguay.

LESCHENAULTIA (or *Lechenaultia*). *Goodeniaceæ.* Australian heath-like herbs or shrubs with linear entire lvs. and yellow, red or violet fls. solitary or in corymbs; may be grown out-of-doors in Calif.

biloba. Shrub to 3 ft.: lvs. to ½ in. long: fls. blue, to 1 in. long, the lobes spreading and with dark blue veined wings.

floribunda. Shrub to 3 ft.: lvs. to ⅓ in. long: fls. white or blue, rarely violet or yellow, to ⅔ in. long, the lobes spreading and wings not veined.

LESPEDEZA. Bush Clover. *Leguminosæ.* Herbs or subshrubs with trifoliolate lvs., papilionaceous fls. or sometimes the fertile fls. without petals, and flat pods consisting of only 1 fertile joint; native in N. Amer., Asia and Australia.

The ornamental species are hardy North and thrive in any upland soil. Propagated by division or *L. formosa* by greenwood cuttings under glass. *L. striata* is grown as a hay and green-manure crop in the South. Seed of it should be sown early in spring.

bicolor (*Desmodium bicolor*). Shrub to 10 ft.: lfts. oval: fls. purple, the calyx-lobes blunt, in racemes, July–Oct. Japan.

capitata. Per. to 5½ ft., silvery-pubescent: lfts. oblong: fls. yellowish-white with purple spot on standard, in dense heads. Ont. to Fla. and La.

chinensis: *Campylotropis macrocarpa.*

ciliata: *Campylotropis macrocarpa.*

formosa (*L. Sieboldi. Desmodium penduliflorum*). Per. herb or subshrub to 10 ft.: lfts, elliptic: fls. rose-purple, the calyx-lobes long-pointed, in long drooping racemes, Sept.–Oct. Japan.

japonica (*Desmodium japonicum*). Similar to *L. formosa* but fls. pure white. Japan.

macrocarpa: *Campylotropis macrocarpa.*

Sieboldi: *L. formosa.*

striata. Japan Clover. Ann. to 1½ ft.: lfts. small and numerous: fls. pink or purple, small, axillary. China, Japan; nat. in N. Amer.

violacea. Per. to 3 ft.: lfts. oval or oblong: fls. violet-purple, small, in few-fld. clusters. N. H. to Mex.

LESQUERELLA. *Cruciferæ.* Small ann. and per. grayish herbs, mostly in W. N. Amer., with the look of Alyssum: lvs. simple, in per. species usually in rosettes as well as on the st.: fls. small but often showy because of numbers, commonly yellow: fr. a short more or less inflated pod or silicle. **L. Engelmanni** is listed: per., cespitose, to 1½ ft.: lower lvs. oblanceolate, upper ones narrow: fls. yellow, in corymbose clusters. Tex., New Mex., Colo.

LETTSOMIA. *Convolvulaceæ.* A good number of climbing shrubs of trop. E. Asia and trop. Afr., allied to Argyreia, one of which has been intro. in S. Fla. **L. capitata** (*L. strigosa*) is a tall hairy twiner: lvs. nearly orbicular, cordate, 5 in. long: fls. purple, 2 in. long. India.

LETTUCE (*Lactuca sativa* and vars.). Leading salad vegetable, grown for its developed thin radical leaves and in one odd race for the thick edible stem. It is a hardy annual of simple culture, but the best results are obtainable only with well-selected seeds and on suitable open moisture-holding soil and good tillage; the plant must grow rapidly and continuously to produce a good crop of tender leaves. In the highly developed varieties the leaves form a dense rosette or clump, known as the head or cabbage lettuces in contradistinction to the leaf or loose lettuces in which the basal leaves are hardly consolidated into a ball or head; sometimes the leaf lettuces are crisped and curled. The Cos lettuces, known in romaine salad, are summer varieties with leaves aggregated into an erect oblong head or column, the leaves being mostly long-oblong rather than the usual broad type. A kind little known in this country and which would hardly pass as a lettuce is the so-called asparagus lettuce, grown for its long thick main stem before the plant goes to seed; the leaves are long and narrow and tapering to the point; it may be grown to some extent in this country by the Chinese and perhaps by Europeans. See *Lactuca.*

Large areas are now devoted to lettuce for the general market, under intensive methods both as to growing and handling. Muck lands are well adapted to the crop. This large-area growing requires special experience, and is not covered in the present entry.

Lettuce seed is commonly sown in a seedbed, either under glass or in the open ground. From this bed the little plants are transferred to their permanent positions 6–12 inches apart in rows far enough asunder to allow of hand tillage; or they may be set closer and thinned as they grow. Lettuce plants that are crowded do not produce the firm rosettes of good substance that the best markets or the best tastes demand.

As lettuce soon runs to seed, particularly in warm weather, only a small space should be grown at each sowing for home use, and the sowings may be made every week or two until summer approaches; and some varieties do well in warm weather. The Cos lettuces are summer varieties but do not thrive in the hot suns and soils in most parts of North America. As a rule, 5 to 8 feet of row supplies sufficient lettuce to each person for each sowing. Head lettuces are more difficult to bring to perfection than the ordinary loose lettuces, unless one has soils and conditions specially adapted. Soils for lettuce should be fertile and well-drained, of the kind known as "quick." The crop is better if cut in the morning before the plants have become soft, and care should be taken not to expose it to the sun. Lettuce is soon ruined by careless cutting and handling.

Lettuce is usually followed by a succession-crop, as cabbages, celery, late beets, snap beans; and sometimes it is grown as a companion-crop along with early cabbages, cauliflowers or other longer-season plants. Good lettuce should be had for the table in six to eight weeks from the sowing, and the thinnings may be used still sooner.

Lettuce does well in hotbeds and in forcing-houses. The forcing of lettuce has come to be a special industry, for the understanding of which the reader should go to treatises written for the purpose.

LETTUCE, WATER-: *Pistia Stratiotes.*

LEUCADENDRON. *Proteaceæ.* S. African diœcious trees and shrubs of many species, with entire coriaceous lvs., staminate fls. in terminal sessile heads, pistillate in terminal cone-like heads and subtended by woody bracts, and fr. a nut; grown out-of-doors in Calif. and rarely under glass in the N. Propagated by seeds.

argenteum. Silver-Tree. Tree to 30 ft.: lvs. lanceolate, to 6 in. long, sessile, densely covered with silvery silky pubescence: staminate heads to 2½ in. across, the fruiting heads large and heavy.

plumosum. Shrub to 7 ft.: lvs. linear or linear-lanceolate, to 2½ in. long. pubescent: staminate heads ½ in. long, the pistillate to 1¾ in long.

Stokœi. Lvs. oblong or oblong-lanceolate, to 3½ in. long, glabrous: staminate heads surrounded by brown bracts, 1 in. across.

venosum. Shrub to 4 ft.: lvs. oblanceolate, to 3¼ in. long, glabrous: staminate heads 1 in. across.

LEUCÆNA. *Leguminosæ.* Trees and shrubs with 2-pinnate lvs., white fls. in globose heads, and flattened broadly linear pods; one species grown in warm countries for ornament, the edible pods and seeds, and for timber. Native in warm parts of Amer. and Pacific Isls.

glauca. White Popinac. Tree to 30 ft. with acacia-like foliage: fl.-heads 1 in. or more across: pods to 6 in. long. Tropics, but nat. in Fla. and elsewhere.

LEUCANTHEMUM: *Chrysanthemum.*

LEUCERIA: *Leucheria.*

LEUCHERIA (*Leuceria*). *Compositæ.* Ann. and per. more or less white-woolly herbs of S. S. Amer. and the Andes, one sometimes grown in the flower-garden: lvs. entire, lobed or dissected: heads small, with rays, paniculate or long-stalked: pappus mostly plumose, united at base. **L. senecioides** is a gray diffuse ann. to 1½ ft.: lvs. small and narrow, irregularly sinuate-pinnatifid with sharp points, sessile and clasping: heads many, ¼–½ in. across, rays white. Chile.

LEUCOCASIA: *Colocasia.*

LEUCOCORYNE: *Brodiæa uniflora.*

LEUCOCRINUM. *Liliaceæ.* One rhizomatous herb native from Neb. to Calif. and Ore., without true st., grown for its spring bloom. **L. montanum.** Sand-or Star-Lily. Fls. pure white, fragrant, with a tube 1 to 4 in. long, borne near surface of ground in clusters. —Sometimes transferred to gardens.

LEUCOJUM. Snowflake. *Amaryllidaceæ.* Small bulbous herbs with basal lvs. and white fls. tinged with red or green, solitary or in umbels at top of hollow scape, the perianth-segms. distinct. Hardy and should remain undisturbed for a number of years. Plant 3 in. deep in well-drained soil.

æstivum. To 1 ft.: lvs. to 1½ ft. long and ½ in. wide: fls. white tipped with green, ¾ in. long, on long drooping pedicels, 2–8 together, in late spring. Cent. and S. Eu.

autumnale. To 9 in.: lvs. thread-like, after fls.: fls. white tinged with red, ½ in. long, on long drooping pedicels, 1–3 together, in autumn. Medit. region.

vernum. To 1 ft.: lvs. to 9 in. long and ½ in. wide: fls. white tipped with green, ¾ in. long, on short somewhat drooping pedicels, solitary, in early spring. Cent. Eu.

LEUCOPHYLLUM. *Scrophulariaceæ.* Shrubs native in Tex. and Mex., with alternate entire silvery-tomentose lvs., solitary axillary fls. with tube and 5-lobed limb, and capsular frs.; one is grown as a low ornamental hedge plant in its native region and sometimes as a lawn plant.

texanum. To 8 ft.: lvs. obovate, to 1 in. long: fls. bell-shaped, violet-purple, 1 in. across.

LEUCOPHYTA: *Calocephalus Brownii.*

LEUCOTHOË. *Ericaceæ.* Deciduous and evergreen shrubs of wide distribution in N. Amer., Asia, S. Amer., Madagascar, with alternate short-stalked finely toothed lvs., small fls. in terminal and axillary racemes or panicles in spring, and capsular frs.

The species require protection in the North. They thrive in a moist soil of peat and sand. Propagated by seeds under glass in sphagnum and sand and seedlings set out-of-doors, by division, by cuttings and underground runners. Plants may be readily transplanted from the wild.

axillaris. Closely resembling *L. Catesbæi* but with abruptly acuminate shorter stalked lvs. Va. to Fla. and Miss.

Catesbæi (*Andromeda Catesbæi*). Drooping L. To 6 ft., evergreen: lvs. ovate-lanceolate to lanceolate, to 7 in. long, shining: fls. white, in racemes to 3 in. long, Apr.–May. Va. to Ga. and Tenn.

Grayana. To 3 ft., partially evergreen: lvs. elliptic to obovate, to 3 in. long, ciliate: fls. whitish or pinkish, in racemes to 4 in. long, July–Sept. Japan.

racemosa (*Eubotrys racemosa*). Sweetbells. Six–12 ft., deciduous: lvs. oblong to ovate or elliptic, to 3 in. long, pubescent beneath at least on veins: fls. white or light pink, cylindric, to ⅓ in. long. Moist places and swamps, Mass. to Fla. and La.

recurva (*Eubotrys recurva*). Redtwig L. To 12 ft., deciduous: lvs. oval or elliptic, to 4 in. long: fls. white, in curved racemes to 4 in. long, Apr.–June. Va. to Ga. and Ala.

LEUZEA. *Compositæ.* Per. or bien. herbs with basal or alternate lvs. and purple heads of disk-fls.; pappus plumose; native in Eu., Afr., Australia. Sometimes grown for ornament.

conifera (*Centaurea conifera*). Per. to 1 ft.: lvs. lanceolate, entire or pinnatifid, white-tomentose beneath: heads solitary, cone-like, to 2 in. long, with showy blunt splitting scales. S. Eu.

LEVISTICUM. *Umbelliferæ.* One per. herb grown for the aromatic frs. which are used in confectionary and also for its striking ornamental character. **L. officinale** (*Hipposelinum Levisticum*). Lovage. To 6 ft.: lvs. ternately compound, the segms. coarsely toothed above the middle: fls. greenish-yellow, in compound umbels subtended by narrow deflexed bracts. S. Eu.; nat. Va. to Pa. —Propagated by seeds and division of the root.

LEWISIA. *Portulacaceæ.* Fleshy per. herbs with thick starchy roots which are sometimes eaten, basal lvs. in rosettes, white, rose or red fls. borne on scapes, and capsular frs.; native in W. N. Amer.

Lewisias are planted in rock-gardens and succeed in deep loose gritty soil, with fair supply of humus. Deciduous species (*L. nevadensis, oppositifola, rediviva*) thrive in sun; others profit by partial shade. With a little protection some of them stand in the northeastern states. Propagated by seeds or division of roots in spring.

columbianum. Lvs. linear-spatulate, to 2 in. long: fls. white or pink veined with red, ⅓ in. long, in panicles on scapes to 1 ft. high. Mts. Ore., Wash.

Cotyledon. Lvs. spatulate, to 3 in. long: fls. white veined with pink, ½ in. long, in panicles on scapes to 10 in. high. Calif.

Finchii. Lvs. to 3 in. long and 1½ in. wide: fls. pink margined with white, in many-fld. cymes on scapes to 1 ft. high. Calif.

Howellii. Lvs. oblong to ovate: fls. deep rose, ½ in. long, in cymes on scapes to 6 in. high. Ore.

Leana. Lvs. narrow-linear, to 2½ in. long: fls. red, ¼ in. long, in panicles on scapes to 9 in. high. Ore., Calif.

minima. Lvs. to 2 in. long, narrow-linear: fls. white, on a 2-bracted scape usually not exceeding the foliage. Yellowstone.

nevadensis. To 4 in., the scape with pair of bracts near middle, from a fleshy tuber-like root: lvs. linear, to 2½ in. long, surpassing the scapes: fls. white, solitary. Utah, Calif. to Wash.

oppositifolia. Lvs. linear, to 3 in. long: fls. white or pink, ½ in. long, in 2–4-fld. umbels on scapes to 8 in. high. Calif.

Purdyi: listed name.

pygmæa. Lvs. linear, to 2 in. long: fls. white, ¼ in. long, on scapes to 2 in. high. Sierra Nevada and Rocky Mts.

rediviva. Bitter-Root. Lvs. fleshy, linear, 1 in. long: fls. rose or white, to 1 in. long, on scapes to 2 in. high. B. C. to Rocky Mts.

rosea: listed name.

triphylla. To 4 in. high, from a globular corm, the scape partly underground: fls. white, in an umbel subtended by 2 or 3 narrowly linear lvs. Ida., Wash. to Calif.

Tweedyi. To 4 in. or more, from a very thick root: lvs. fleshy, obovate, to 4 in. long: fls. salmon-pink, nearly 2 in. across, 1–3 on scapes that more or less surpass the lvs. Wash.

LEYCESTERIA. *Caprifoliaceæ.* Himalayan deciduous shrubs with opposite lvs., funnelform 5-lobed fls. in leafy-bracted spikes, and fr. a berry; one species grown out-of-doors in S. U. S. and in protected places N. Propagated by seeds and cuttings.

formosa. HIMALAYA-HONEYSUCKLE. To 6 ft.: lvs. cordate-ovate to ovate-lanceolate, to 7 in. long: fls. purplish, ¾ in. long, the bracts purple, in drooping spikes to 4 in. long, Aug.–Sept.

LIATRIS (*Lacinaria*). BLAZING STAR. GAYFEATHER. BUTTON SNAKEROOT. *Compositæ.* Strict and mostly simple-stemmed or sparingly-branched per. usually tuberous-based herbs with alternate narrow entire lvs. and rose-purple or white heads of disk-fls. borne in spikes or racemes, in late summer and in autumn; pappus of bristles; native in N. Amer. and often transplanted to the wild-garden and border. Propagated by seeds, division of the clumps, and some species by offsets.

callilepis: plants bearing this name are referable to *L. spicata.*

Chapmanii. To 2 ft.: lvs. linear, to 4 in. long: heads ½ in. long, of about 3 purple fls. in dense spikes. Ga., south.

cylindracea. To 1½ ft.: lvs. linear, to 8 in. long: heads to 1 in. long, of 15–60 purple fls., in loose spikes. Ont. to Mo.

dubia: *L. graminifolia* var.

elegans. To 4 ft.: lvs. linear, to 6 in. long: heads ½ in. long, of 4–5 white fls. and rose-tipped petal-like inner bracts, in dense spikes to 1½ ft. long. Va. to Fla. and Tex.

fruticosa: *Garberia fruticosa.*

gracilis. To 3 ft., sts. pubescent: lvs. lanceolate, upper reduced to bracts: heads ¼ in. long, of 5–15 purple fls., in racemes. Ga., Fla., Ala.

graminifolia. To 3 ft.: lvs. linear, to 1 ft. long: heads ½ in. long, of 5–15 purple fls., in long spikes, racemes or sometimes panicles. N. J. to Fla. Var. **dubia** has narrower involucral bracts.

intermedia: *L. squarrosa* var.

ligulistylis. To 1½ ft., sts. pubescent: lvs. linear-lanceolate, to 5 in. long: heads ¾ in. long, of 50–70 purple fls., the bracts rose-tipped, in corymb-like racemes. Man. to Colo.

montana: *L. spicata* var.

odoratissima: *Trilisa odoratissima.*

paniculata: *Trilisa paniculata.*

pauciflora. To 3 ft.: lvs. linear, to 4 in. long: heads ¾ in. long, of 3–5 purple fls., in one-sided racemes. S. C. to Fla.

pilosa. To 3 ft.: lvs. linear, basal 1 ft. or more long: heads to ¾ in. long, of 5–15 purple fls., the bracts purple, in loose racemes. Va. to Ga. and Ala.

punctata. To 2½ ft.: lvs. linear, to 6 in. long, very punctate: heads to ¾ in. long, of 3–6 purple fls., in dense spikes. Minn. to New Mex.

pycnostachya. To 5 ft., hairy above: lvs. linear-lanceolate, lower to 1 ft. long: heads ½ in. long, of 3–6 purple fls., in dense spikes to 1½ ft. long. Minn. to La. and Tex.

scariosa. To 6 ft., pubescent: lvs. oblong-lanceolate, lower to 1 ft. long: heads to 1 in. long, of 15–45 bluish-purple fls., bracts often purple-tipped, in interrupted racemes. Me. to Fla. and Tex. Var. **alba** is listed.

spicata. To 6 ft.: lvs. linear-lanceolate, lower to 1 ft. long: heads ½ in. long, of 5–13 blue-purple or white fls., in dense spikes to 15 in. long. Mass. to Fla. and La. Var. **montana.** Stout and dwarfer: lvs. broader: spike shorter. Mts., Va. south. Var. **pumila** is listed.

squarrosa. To 2 ft., pubescent: lvs. linear, to 6 in. long: heads to 1½ in. long, of 15–60 purple fls., solitary or few, subtended by leaf-like bracts. Ont. to Fla. and Tex. Var. **intermedia** (*L. intermedia*) has narrower heads and less spreading bracts.

tenuifolia. To 4 ft.: lvs. thread-like, to 10 in. long: heads ½ in. long, of about 5 purple fls., in racemes 1 ft. or more long. N. C. to Fla.

LIBERTIA. *Iridaceæ.* Per. herbs with fibrous roots, native in Australia, New Zeal. and S. Amer.: lvs. mostly crowded at base of st., linear: fls. clustered in axils of sheathing bracts, without tube, the inner segms. longer. Grown out-of-doors in S. U. S. Propagated by division and seeds.

formosa. To 3 ft.: lvs. to 1½ ft. long, stiff: fls. white, to ¾ in. long, the outer segms. greenish-brown, the pedicels shorter than bracts. Chile.

grandiflora. To 3 ft.: lvs. to 2½ ft. long, stiff: fls. white, 1 in. or more across, the outer segms. greenish outside, the pedicels longer than bracts. New Zeal.

ixioides. To 2 ft.: lvs. to 1 ft. or more long, with pale midrib: fls. white, to 1 in. across, the outer segms. greenish outside, pedicels longer than bracts. New Zeal.

LIBIDIA: *Cæsalpinia coriaria.*

LIBOCEDRUS. INCENSE-CEDAR. *Pinaceæ.* About 9 species of evergreen trees, allied to Thuja, with frond-like branchlets, scale-like lvs. and oblong cones of usually 4 woody scales; of wide distribution and only *L. decurrens* adapted to the climate of the northeastern states. For cult. see *Conifers.*

Bidwillii. To 50 ft.: lvs. all alike: cones to ⅓ in. long. New Zeal.

chilensis. To 60 ft.: lateral lvs. larger than facial, with silvery line beneath: cones ½ in. long. Chile.

cupressoides. To 100 ft.: lvs. all alike: cones ovate. Chile to Patagonia.

decurrens. To 100 ft. or more: lateral lvs. larger than facial: cones to 1 in. long. Ore. to Lower Calif.; hardy in S. New England in sheltered positions near coast.

Doniana: *L. plumosa.*

macrolepis. To 100 ft.: lvs. all alike: cones ¾ in. long, of 6 scales. China, Formosa.

plumosa (*L. Doniana*). To 100 ft.: lateral lvs. larger than facial, with white band below: cones ½ in. long. New Zeal.

LIBONIA: *Jacobinia pauciflora.*

LICORICE: *Glycyrrhiza.*

LICUALA. *Palmaceæ.* Small hermaphrodite fan-palms with solitary or clustered somewhat ringed sts., more than 70 species in trop. Asia, Pacific Isls. to Australia: lvs. more or less orbicular in outline, stiffish and plicate, petiole commonly spiny, blade deeply parted or undivided, edges dentate or erose: spadices among the lvs., simple or branched, often greatly elongated and with many side branches; stamens 6: fr. small, mostly size of pea with terminal stigmatic point and 1 seed. Good tub palms in the juvenile state, but probably do not thrive planted in the open in the continental U. S. See *Palm.*

grandis (*Pritchardia grandis*). St. solitary, to about 6 ft., when young leaf-bearing nearly half its length: lf.-blade nearly orbicular or broader (to 3 ft.) than long, plaited, lobed only an in. or so along the continuous margin and each lobe 2-toothed, petiole long and slender and spiny. New Britain Isl.—A good greenhouse and tub palm.

horrida: *L. spinosa.*

Jeanenceyi. Hort. name for a palm said to come from New Guinea: dwarf, uniform in shape: lvs. deep shining green; segms. 5–8, blunt.

peltata. Sts. usually several, to 15 ft.: lvs. orbicular, 3–5 ft. across, appearing as if peltate; segms. 20–30,

X. Red-Pepper. — Bell peppers, now an important commodity crop

extending nearly or quite to center, many-toothed at apex and teeth bifid; petiole long, armed with dark colored thick-based long stout spines: branches of spadix (as also outside of fls.) brown-tomentose; fls. ½ in. or more long, very conspicuous; filaments not united above throat of corolla: fr. ½ in. long, ellipsoid. India.

spinosa (*L. horrida*). Sts. several, tufted, to 10 ft., the plant making a mass of foliage from top to bottom: lf.-blade nearly orbicular to somewhat reniform, 3–4 ft. across, parted to the center into about 18 lobes which are variously toothed at the apex and which become declined or hanging; petiole very long and with rather small separated spines: spadix branches more or less scurfy-pubescent; fls. about ⅙ in. long; filaments united above throat of corolla: fr. obovoid, about ¼ in. long. Malaya.—Sometimes grown as *L. peltata*.

LIFE-PLANT: *Bryophyllum pinnatum*.

LIGNUM-VITÆ: *Guaiacum*.

LIGULARIA. *Compositæ.* Herbaceous perennials with broad alternate or basal lvs. and large reflexed or nodding heads in racemes or corymbs, of long yellow ray-fls.; differs from Senecio chiefly in the bracts of the involucre which are of two forms; native in Eu. and Asia, a few grown in the open or indoors. Of easy cult. and usually propagated by cuttings or division.

clivorum (*Senecio clivorum*). To 4 ft.: basal lvs. reniform or nearly orbicular, sometimes 20 in. across, sharply toothed: fls.-sts. branched; heads to 4 in. across, rays orange-yellow, disk dark brown. Japan, China.

Doria: *Senecio Doria*.

Doronicum: *Senecio Doronicum*.

Farfugium: *L. Kaempferi*.

japonica (*Senecio japonicus. Erythrochæte palmatifida*). To 5 ft. or more: lvs. 1 ft. or more across, deeply palmately cut into 7–11 narrow-lobed divisions: fl.-sts. branched; heads 3 in. across, orange. Japan.

Kaempferi (*L. Farfugium. Farfugium* and *Senecio Kaempferi*). To 2 ft., rhizomatous: lvs. to 10 in. across, cordate-orbicular, wavy-toothed: fl.-sts. branched; heads to 2 in. across, light yellow. Japan. Var. **aureo-maculata** (*Farfugium grande. F. maculatum*). LEOPARD-PLANT. Lvs. blotched with yellow, white or sometimes light rose. Var. **argentea**. Lvs. glaucous-green marked with creamy-white.

macrophylla (*Senecio Ledebourii*). To 6 ft.: lvs. to 2 ft. long, elliptic or oval-oblong, toothed: heads yellow, in long dense terminal spikes. Caucasus.

sibirica (*Senecio sibiricus*). To 4 ft.: lvs. reniform or triangular, to 1 ft. across, coarsely toothed: heads in terminal racemes, the yellow rays to ¾ in. long. Eu., Asia.

stenocephala (*Senecio stenocephalus*). Lvs. reniform, to 16 in. across, deeply cordate, coarsely toothed: heads in racemes 1 ft. or more long, yellow. China.

tyrolensis: listed name.

Veitchiana (*Senecio Veitchianus*). To 6 ft., unbranched: lvs. to 16 in. long, sharply toothed: heads very numerous, 2½ in. across, yellow. China.

Wilsoniana (*Senecio Wilsonianus*). GIANT GROUNDSEL. To 5 ft.: lvs. reniform-cordate, to 20 in. long, sharply toothed: heads in elongated columnar spikes, 1 in. across, yellow. China.

LIGUSTICUM. *Umbelliferæ.* Per. herbs with ternately compound lvs., white fls. in large compound umbels, and scarcely flattened frs.; native in the northern hemisphere; sometimes planted for ornament in borders.

latifolium: *Anisotome latifolia*.

pyrenæum. To 4 ft.: lvs. 3–4-pinnate into linear segms. Pyrenees.

LIGUSTRUM. PRIVET. *Oleaceæ.* Shrubs or rarely trees, deciduous or evergreen, native in Asia, Australia and Medit. region, having opposite entire often thick lvs. mostly oblong or ovate, small white funnelform bisexual fls. in terminal panicles, and fr. a black berry-like drupe with 1–4 seeds.

Privets are commonly planted for hedges and in shrubberies for ornament, and sometimes as single specimens. They are not particular as to soil. Propagated by cuttings of young or mature wood under glass, by division, by seeds, and varieties by grafting on *L. vulgare* or *L. ovalifolium*. Many of them are very hardy and durable, and well adapted to mass plantings.

acuminatum (*L. ciliatum* of some authors). To 6 ft., deciduous: lvs. to 3 in. long, pubescent on midrib beneath: fls. with corolla-tube much longer than lobes, in panicles 2 in. long, anthers exserted, June. Japan. Var. **macrocarpum** has larger lvs. and fr.

amurense. To 15 ft., deciduous or half-evergreen: lvs. to 2½ in. long, pubescent on midrib beneath: fls. with corolla-tube much longer than lobes, in panicles 2 in. long, June-July. China. Var. **pendulum** is listed.

buxifolium: *L. vulgare* var.

californicum: *L. ovalifolium*.

ciliatum: *L. acuminatum, L. Ibota*.

coriaceum: *L. japonicum* var. *rotundifolium*.

Delavayanum. To 6 ft., evergreen: lvs. to 1 in. long, shining above, glabrous: fls. with corolla-tube twice longer than lobes, in panicles to 2 in. long, June. China; not hardy N.

Henryi. To 12 ft., evergreen: lvs. to 2 in. long, shining above, glabrous: fls. with corolla-tube twice longer than lobes, in panicles to 5 in. long, Aug. China; to be planted far S.

Ibolium. Hybrid between *L. ovalifolium* and *L. obtusifolium*: hardy N.

Ibota (*L. ciliatum* of some). To 6 ft., deciduous: lvs. to 2 in. long, pubescent on midrib beneath: fls. with corolla-tube much longer than lobes, in head-like panicles ½ in. long, June. Japan.—Not ornamental. The plant heretofore known as *L. Ibota* and in common cult. now becomes *L. obtusifolium*.

ionandrum. To 10 ft., evergreen: lvs. ½–1 in. long: fls. with corolla-tube longer than lobes, in dense panicles to 1 in. long. China; adapted far S.

japonicum (*L. Kellermannii*). To 10 ft. or more, evergreen: lvs. to 3 or 4 in. long, glabrous, leathery, short-pointed or nearly obtuse: fls. with corolla-tube slightly longer than lobes, in panicles to 6 in. long, July–Sept. Japan, Korea; grown in southern states. Var. **rotundifolium** (*L. coriaceum*). Lvs. nearly orbicular, to 2½ in. long, obtuse or emarginate at tip. Var. **variegatum**. Lvs. variegated and edged with white.

Kellermannii: *L. japonicum*.

lodense: hort. name.

lucidum (*L. japonicum macrophyllum*). To 30 ft., evergreen: lvs. to 4 or 6 in. long, shining, glabrous, acuminate: fls. with corolla-tube as long as lobes, in panicles to 10 in. long, Aug.–Sept. China, Korea, Japan; stands only far S. Var. **tricolor** has lvs. variegated with yellow, pink when young.

Massalongianum (*L. myrtifolium*). To 3 ft., evergreen: lvs. linear-lanceolate, to 3 in. long, glabrous: fls. with corolla-tube much longer than lobes, in panicles to 3½ in. long, July–Aug. Himalayas; may be planted far S.

myrtifolium: *L. Massalongianum*.

nepalense. Evergreen: lvs. to 5 in. long, pubescent beneath: fls. with corolla-tube about length of lobes, in broad panicles, July–Aug. Himalayas; adapted only to warm regions. Var. **variegatum** is listed.

obtusifolium. To 10 ft., deciduous: lvs. to 2½ in. long, pubescent beneath: fls. with corolla-tube about three times length of lobes, in nodding panicles to 1½ in. long, July. Japan. This is the plant commonly known as *L. Ibota*. Var. **Regelianum** (*L. Regelianum*). Low, branches spreading horizontally.

ovalifolium (*L. californicum*). CALIFORNIA P. To 15 ft., half-evergreen: lvs. to 2½ in. long, shining above, glabrous: fls. with corolla-tube much longer than lobes, in panicles to 4 in. long, July. Japan; not reliable in northern states. Variegated lvd. forms are **albo-marginatum**, edged with creamy-white, **aureo-marginatum** (var. *aureum*), edged with yellow, **variegatum**, marbled with pale yellow.

pekinense: *Syringa pekinensis*.

pendulum: listed species-name; presumably a pendulous form of *L. vulgare* or *L. amurense.*

Prattii is a synonym of *L. Delavayanum.*

Quihoui. To 6 ft., deciduous: lvs. to 2 in. long, glabrous: fls. with corolla-tube as long as lobes, sessile, in panicles to 8 in. long, Aug.–Sept., stamens exserted. China; not hardy N.

Reevesii: hort. name.

Regelianum: *L. obtusifolium* var.

sinense. To 12 ft. or more, deciduous: lvs. to 3 in. long, pubescent on midrib beneath: fls. with corolla-tube shorter than lobes, in pubescent panicles to 4 in. long, July. China; not hardy N. Var. **Stauntonii** (*L. Stauntonii. L. chinense* var. *nanum*). Lower with broader panicles.

Stauntonii: *L. sinense* var.

vulgare. Common P. or Prim. To 15 ft., deciduous: lvs. to 2½ in. long, glabrous: fls. with corolla-tube about length of lobes, in dense panicles to 1½ in. long, June–July. Medit. region; nat. in E. U. S. Some of the hort. vars. are: **argenteum-variegatum,** lvs. variegated white; **aureum,** lvs. yellow, **aureo-variegatum,** lvs. variegated yellow; **buxifolium,** lvs. half-evergreen, to 1 in. long; **glaucum** (var. *albo-variegatum*), lvs. glaucous edged with white; **leucocarpum,** fr. white; **xanthocarpum,** fr. yellow.

LILAC: *Syringa.* **Indian:** *Melia Azedarach.* **Summer:** *Buddleja Davidi.*

LILIACEÆ. Lily Family. More than 200 genera of monocotyledonous per. herbs, many of them having bulbs, corms or a crown of fleshy rootstocks, sometimes woody and tree-like, of wide distribution. The family is characterized by regular fls. with 6-parted or -lobed perianth or 6 separate segms., usually all the parts petal-like, 6 or sometimes 3 stamens, commonly superior 3-celled ovary, and fr. a berry or dehiscent caps. Species probably upwards of 2000, many of them (as the lilies) with very showy fls., and some (as the onions) with edible bulbs. Some of the plants known as lilies belong to other families, particularly the Amaryllidaceæ.

The Liliaceæ yields medicinal plants, edible parts, and a wide range of beautiful ornamental subjects. The genera known to hort. are: Agapanthus, Aletris, Allium, Aloe, Amianthium, Androstephium, Anthericum, Arthropodium, Asparagus, Asphodeline, Asphodelus, Aspidistra, Astelia, Beaucarnea, Blandfordia, Bloomeria, Brevoortia, Brodiæa, Bulbine, Bulbinella, Bulbocodium, Calochortus, Camassia, Chamælirium, Chionodoxa, Chlorogalum, Chlorophytum, Clintonia, Colchicum, Convallaria, Cordyline, Danaë, Dasylirion, Dianella, Disporum, Dracæna, Eremurus, Erythronium, Eucomis, Eustrephus, Fritillaria, Gagea, Galtonia, Gasteria, Geitonoplesium, Gloriosa, Haworthia, Helonias, Hemerocallis, Hesperaloe, Hesperoyucca, Hosta, Hyacinthus, (Ixiolirion), Kniphofia, Lachenalia, Lapageria, Leucocrinum, Lilium, Liriope, Maianthemum, Medeola, Melanthium, Milla, Mondo, Muscari, Nolina, Nothoscordum, Ornithogalum, Paradisea, Paris, Philesia, Phormium, Polygonatum, Puschkinia, Reineckia, Rhipogonum, Rohdea, Ruscus, Samuela, Sansevieria, Schizobasopsis, Scilla, Semele, Smilacina, Smilax, Stenanthium, Streptopus, Thysanotus, Tricyrtis, Trillium, Tulipa, Urginea, Uvularia, Veltheimia, Veratrum, Xanthorrhœa, Xerophyllum, Yucca, Zygadenus.

LILIUM. Lily. *Liliaceæ.* Per. leafy-stemmed erect herbs bearing terminal fls. or fl.-clusters, native in the northern hemisphere, having scaly bulbs, scattered or whorled usually narrow lvs. and fls. in a wide range of colors but never true blue, prevailingly white, orange or orange-red, the perianth-segms. distinct; often fragrant. Many of them are among the most stately of garden plants. They are late spring and summer bloomers.

Most lilies are of easy cultivation and hardy in the North, although sometimes needing winter protection and always profiting by it. In well-prepared ground and a suitable location, the plants may be allowed to stand year after year. Remove the seed-pods immediately after flowering, and allow the foliage to mature naturally. A light fertile sandy or loamy soil is suitable, with some leaf-mold added. As a rule, lilies do better in partial shade or not fully exposed to heat and winds. A handful of sand or gravel may be placed under each bulb and the top of the bulb should be at least 4 inches below the surface in those kinds that make roots above the bulb, or deeper with *L. auratum* and others with very large bulbs, but shallow planting is the rule with those that make roots only at bottom. Propagated by division of the offsets as soon as the tops die or early in autumn; also by bulb scales or by aerial bulblets, which will produce flowering plants in two or three years. Seeds yield variations.

Lilies may be forced in the greenhouse. The bulbs should be potted and placed in a coldframe and covered with sphagnum, coal ashes or other porous material, until they are well rooted in the pots. They may then be taken to the greenhouse and kept in a temperature of about 50° for ten days, and then when growth begins raised to 60° night temperature. The plants should be in flower in about thirteen weeks.

The lilies are subject to serious diseases, for the nature and treatment of which consult the most recent literature or the specialists in the subject.

Alexandræ: *L. longiflorum* var.

amabile. To 3 ft., pubescent: fls. of the Martagon kind, racemose, red with dark spots, segms. to 2 in. long and strongly reflexed. Korea.

auratum. Goldband L. To 6 ft.: fls. white spotted with crimson, each segm. with central yellow stripe, to 12 in. across, fragrant, horizontal or drooping. Japan. In var. **pictum** the tip of the band is crimson, and in **rubrum** the band is crimson and very broad. Var. **platyphyllum** (*macranthum*) has broader lvs. and less spotted fls. Var. **Wittei** has fls. spotted yellow.

Bakerianum. To 3 ft.: fls. greenish-yellow changing to creamy-white, spotted with red-brown inside, fragrant, to 2½ in. across. Burma, W. China.

Batemanniæ: an improved form of *L. dauricum* var. *venustum.*

Bloomerianum: *L. Humboldtii.*

Bolanderi. Thimble L. To 3 ft.: fls. reddish-purple spotted with dark purple, to 1¾ in. long, horizontal or somewhat drooping. Calif.

Brownii. To 4 ft.: fls. pure white inside and rose-purple outside, to 9 in. long, slightly fragrant, horizontal. China. A very fragrant form is var. **Colchesteri** (var. *odorum*).

bulbiferum. To 4 ft.: fls. orange-red spotted with purplish-black with yellow center, to 4 in. across. Eu.

callosum. To 2 ft.: fls. bright scarlet dotted with purple-black, to 2 in. across. Japan.

canadense. Meadow L. To 5 ft.: fls. orange-yellow to red, spotted with purplish-brown, to 3 in. across, drooping. N. S. to Ga. and Ala. Var. **coccineum** (var. *rubrum*) has orange-red fls. and var. **flavum** lemon-yellow fls.

candidum. Madonna L. To 4 ft.: fls. clear waxy-white, to 3 in. long, horizontal. S. Eu., S. W. Asia. In var. **maculatum** the fls. are streaked on the outside with purple.

carniolicum. To 3 ft., with 1 to several nodding fragrant orange-red to scarlet fls. 2 in. or less diam., segms. wholly reflexed and usually dotted purplish-black. S. E. Eu.

carolinianum. To 4 ft.: fls. orange-scarlet spotted with purple-brown, to 4 in. long, slightly fragrant, drooping, the segms. strongly reflexed. Va. to Fla. and La.

Catesbæi. Southern Red L. To 2 ft.: fls. scarlet, yellow spotted purple at base, to 5 in. long, erect, the segms. with a claw. N. C. to Fla.

centifolium: *L. leucanthum* var. *chloraster.*

cernuum. To 2 ft.: fls. lilac spotted with purple, to 1½ in. long, fragrant, nodding. Korea, Manchuria.

chalcedonicum. Scarlet Turks-Cap L. To 4 ft.: fls. vermilion-scarlet, rarely spotted, to 3 in. across, with rather disagreeable odor, hanging, the segms. strongly reflexed. Greece. Var. **maculatum** has the fls. spotted with purple.

colchicum: *L. monadelphum.*

columbianum (*L. parviflorum*). To 4 ft.: fls. bright reddish-orange thickly spotted with purple, 2 in. long, drooping, the segms. reflexed. B. C. to Calif.

concolor. Star L. To 4 ft.: fls. vermilion, unspotted, 1½ in. long, slightly fragrant, erect. China, Japan. Var. **pulchellum** usually has spotted fls.

cordifolium (*L. Glehni*). To 4 ft.: fls. white striped purple inside, greenish outside, to 6 in. long, fragrant, erect. Japan.

coridion: one of the forms of *L. concolor* var. *pulchellum.*

croceum. Orange L. To 6 ft.: fls. orange spotted with crimson, to 3 in. long, erect. Mts. of S. Eu.

dahuricum: *L. dauricum.*

dalmaticum: *L. Martagon* var.

dauricum. Candlestick L. To 3 ft.: fls. orange-red spotted with purplish-black, to 5 in. across, erect. Siberia. In many forms. Var. **venustum** has apricot-colored fls. without spots. Var. Wallacei (*L. Wallacei*) has brown spotted fls. Other hort. forms are **erectum, grandiflorum, incomparabile.**

Davidi (*L. Thayeræ*). To 6 ft.: fls. cinnabar-red or scarlet spotted with black, to 3 in. long, nodding. China.

davuricum: *L. dauricum.*

Duchartrei (*L. Farreri*). To 4 ft.: fls. marble-white spotted with purple, fragrant, nodding, to 3 in. long. W. China.

elegans (*L. Thunbergianum. L. dauricum* subsp. *Thunbergianum*). To 2 ft.: fls. orange-red slightly spotted with black-purple, to 6 in. across, erect. Japan. Runs into many forms as: **alutaceum,** to 9 in., with apricot-colored fls. spotted with purple; **atrosanguineum** with dark crimson black spotted fls.; **aurantiacum** with unspotted salmon fls.; **bicolor,** yellow fls. tipped bright red and spotted with black-purple; **fulgens** with deep red spotted fls.; **Horsmanii** with rich crimson fls.; **maculatum** with orange fls. scarlet toward edge.

excelsium: *L. testaceum.*

Farreri: *L. Duchartrei.*

flavum: *L. canadense* var.

formosum: *L. longiflorum* var. *insulare.*

giganteum. To 12 ft.: fls. white tinged with green outside, striped with red-purple inside, to 6 in. long, fragrant, slightly drooping. Himalayas. Var. **himalaicum** is listed.—Plants grown as *L. giganteum* are often *L. longiflorum* var.

Glehni: *L. cordifolium.*

Grayi. To 4 ft.: fls. red tinged with yellow, thickly spotted with purplish-brown, to 2 in. long, horizontal or slightly drooping. Va. and N. C.

Hansoni. To 5 ft.: fls. orange-yellow spotted with purplish-brown, 1½ in. long, fragrant, drooping. Japan.

Harrisii: *L. longiflorum* var. *eximium.*

Henryi. To 9 ft.: fls. orange spotted with brown, 3 in. across, drooping, the segms. recurved. China.

Horsfordi. Hybrid between *L. Leichtlinii* var. *Maximowiczii* and *L. Batemanniæ.*

Humboldtii (*L. Bloomerianum*). To 6 ft.: fls. reddish-orange spotted with purple-brown, 3½ in. long, drooping, the segms. strongly revolute. Calif. Var. **magnificum** is a larger form.

japonicum (*L. japonicum* var. *roseum. L. Krameri*). To 3 ft.: fls. rose or pale pink, to 6 in. long, fragrant, horizontal. Japan.

Kelloggii. To 4 ft.: fls. pink spotted with purplish-black, 2 in. long, erect, the segms. strongly reflexed. Calif.

Krameri: *L. japonicum.*

Leichtlinii. To 6 ft.: fls. lemon-yellow spotted with purplish-brown, 3 in. long, drooping, the segms. reflexed. Japan. Var. Maximowiczii (*L. Maximowiczii*) has salmon-red spotted fls.

leucanthum. Chinese White L. To 6 ft.: fls. greenish-white outside, yellow inside tipped with pure white, to 6 in. long, fragrant, slightly drooping. China. Var. chloraster (*L. centifolium*) has a greenish central mark on the inside of fls. which are sometimes tinged with rose-purple on the outside.

longiflorum. White Trumpet L. To 3 ft.: fls. white, to 7 in. long, fragrant, trumpet-shaped, horizontal. Japan. Var. **Alexandræ.** Fls. wide-funnelform, with dark brown anthers: lvs. broad. Var. **eximium** (*L. Harrisii*). Easter L., Bermuda L., is a taller larger-fld. form. Var. giganteum of gardens has purple-brown sts. and fls. often tinted in bud. Var. **insulare** (var. *formosum*) is an improved popular strain. Var. **multiflorum** resembles var. *eximium.*

Lowii: synonym of *L. Bakerianum.*

maculatum: *L. medeoloides.*

maritimum. Coast L. To 4 ft.: fls. reddish-orange spotted with purple inside, 1½ in. long, horizontal, slightly recurved. Calif.

Martagon. Martagon or Turks-Cap L. To 6 ft.: fls. rose- or dark purple spotted with purplish-black, 2 in. long, drooping, the segms. strongly reflexed. Eu., W. Asia. Var. **album** has white fls. Var. **dalmaticum** (*L. dalmaticum*) has almost black fls.

Maximowiczii: *L. Leichtlinii* var.

medeoloides (*L. maculatum*). Wheel L. To 2½ ft.: fls. apricot to scarlet spotted with black, 2 in. long, drooping, the segms. strongly recurved. Japan, China.

michiganense. The westward extension of the *L. canadense* type, Mich. to Minn. and Mo., differing in its recurved segms. that are mostly red.

monadelphum (*L. colchicum*). Caucasian L. To 6 ft.: fls. golden-yellow, sometimes tinged or spotted with purple, to 5 in. across, drooping, the segms. reflexed. Caucasus, Persia. Var. **Szovitzianum** has lemon-yellow more thickly spotted fls.

myriophyllum. To 4 ft.: fls. greenish-white, yellowish within, often red on keel outside, 1 in. long, fragrant, nodding. China. Var. **superbum** (*L. sulphureum*) has sulfur-yellow fls. reddish outside.—The plants usually cult. as *L. myriophyllum* are *L. regale.*

neilgherrense. To 4 ft.: fls. white flushed with yellow, fragrant, horizontal, to 10 in. long. S. India.

nepalense. To 3 ft.: fls. yellow or greenish-yellow, stained purplish inside, to 6 in. long, fragrant, segms. spreading. Himalayas.

occidentale. Related to *L. pardalinum* but lower, 1½ ft. and upward: fls. nodding, orange or red within and mostly spotted, the narrow segms. 2 in. or less long and somewhat revolute to middle or somewhat below. Calif., Ore.

ochraceum. To 6 ft.: fls. yellow or greenish-yellow spotted red inside, to 5 in. long, fragrant, nodding. S. China, Burma.

pardalinum (*L. Roezli*). Leopard L. To 8 ft.: fls. orange-red spotted with purple, yellow at base, 4 in. across, drooping, the segms. strongly reflexed. Ore. to Calif. Var. **californicum** has smaller lvs. and larger fls.

Parryi. To 4 ft.: fls. pale lemon-yellow, spotted on inside, to 4 in. long, fragrant, horizontal. Calif.

parviflorum: *L. columbianum.*

parvum. Sierra L. To 5 ft.: fls. bright orange-scarlet, yellow at base, spotted with purplish-brown, 1¼ in. long, erect or horizontal. Ore. to Calif. Var. **luteum** has bright yellow spotted fls.

philadelphicum. Orangecup L. To 3 ft.: fls. orange-red spotted with purple, to 4 in. across, erect, the segms. with long claws. Me. to N. C. and Mo.

philippinense. To 1½ ft.: fls. white tinged with green. to 10 in. long, fragrant, horizontal. Philippine Isls. Var. **formosanum** has fls. tinged outside with purple. Formosa.

pomponium. Lesser Turks-Cap L. To 3 ft.: fls. brilliant scarlet spotted with dark purple, to 2 in. across, having disagreeable odor, drooping, the segms. strongly reflexed. S. France, N. Italy.

pyrenaicum. Yellow Turks-Cap L. To 4 ft.: fls. lemon-yellow spotted with purplish-black, 2 in. or more across, nodding. Pyrenees. Var. **aureum** has deeper yellow fls.

regale (*L. myriophyllum* of hort.). ROYAL L. To 5 ft.: fls. lilac or purple outside, white within but yellow at base, to 6 in. long, fragrant, horizontal. W. China.

Roezli: *L. pardalinum.*

rubellum. To 2 ft.: fls. rose-pink, to 3 in. long, fragrant, horizontal. Japan.

rubescens. CHAPARRAL L. To 6 ft.: fls. pale lilac turning to rose-purple, to 2 in. long. erect. Ore. to Calif.

rubrum: *L. canadense* var. *coccineum.*

Sargentiæ. To 6 ft.: fls. rose-purple outside, white within, to 6 in. long, fragrant, horizontal. W. China.

speciosum. SHOWY JAPANESE L. To 4½ ft.: fls. white suffused with rose and spotted with rose-red, 4 in. long, fragrant, drooping, the segms. reflexed. Japan. Runs into numerous forms, as: **album,** fls. nearly white: **Kraetzeri,** fls. white tinged green on outside; **magnificum,** fls. large, suffused with crimson and spotted with pink; **Melpomene,** fls. deeper colored; **roseum,** fls. rose; **rubrum,** fls. carmine-pink.

sulphureum: *L. myriophyllum* var. *superbum.*

superbum. AMERICAN TURKS-CAP L. To 8 ft.: fls. orange-scarlet spotted with purplish-brown, to 4 in. across, drooping, the segms. strongly reflexed. N. B. to Ga. and Mo.

Szovitzianum: *L. monadelphum* var.

tenuifolium. CORAL L. To 3 ft.: fls. bright scarlet, sometimes spotted, to 2 in. across, nodding, strongly reflexed. Siberia, China.

testaceum. NANKEEN L. To 7 ft.: fls. apricot or nankeen-yellow often flushed with pink, rarely spotted, to 3 in. across, fragrant, drooping, the segms. strongly reflexed. Unknown wild; erroneously credited to Japan.—It has been listed as *L. excelsum.*

Thayeræ: *L. Davidi.*

Thomsonianum. To 3 ft., with long racemes and lvs. scattered: fls. pink, fragrant, spreading, broad-funnelform, the narrow segms. to about 1 in. long. Afghanistan to N. W. Himalaya.

Thunbergianum: *L. elegans.*

tigrinum. TIGER L. To 6 ft.: fls. orange- or salmon-red spotted with purple-black, to 5 in. across, drooping, the segms. reflexed. China, Japan; escaped in E. U. S. Var. **flore-pleno** has double fls. Var. **Fortunei** has a densely tomentose st. Var. **splendens** has larger and more abundant fls.

umbellatum. WESTERN ORANGECUP L. To 2 ft.: fls. red or orange, spotted below, to 3 in. long, erect, the segms. with a claw. Mich. to Mex.—Most of the material in the trade under this name belongs either to *L. dauricum* or *L. elegans.*

Wallacei: *L. dauricum* var.

Wallichianum. To 7 ft.: fls. creamy-white tinged with green outside, to 10 in. long, fragrant, horizontal, the segms. with long claw. Himalayas.

warleyense (*L. Willmottiæ*). To 5 ft.: fls. orange-red spotted with brown, to 3 in. across, drooping, the segms. strongly recurved. China.

Washingtonianum. To 6 ft.: fls. white often spotted with purple, to 4 in. long, fragrant, horizontal. Ore. and Calif. Var. **purpureum** is smaller and the fls. change to lilac-purple.

Willmottiæ: *L. warleyense.*

LILY: *Lilium.* **Adobe-**: *Fritillaria pluriflora.* **African-**: *Agapanthus africanus.* **Amazon-**: *Eucharis grandiflora.* **Atamasco-**: *Zephyranthes Atamasco.* **Belladonna-**: *Amaryllis Belladonna.* **Blackberry-**: *Belamcanda chinensis.* **Blood-**: *Hæmanthus.* **Checkered-**: *Fritillaria meleagris.* **Chinese Sacred-**: *Narcissus Tazetta* var. *orientalis.* **Cow-**: *Nymphozanthus.* **Day-**: *Hemerocallis.* **Fawn-**: *Erythronium californicum.* **Ginger-**: *Hedychium.* **Glory-**: *Gloriosa.* **Guernsey-**: *Nerine sarniense.* **Jacobean-**: *Sprekelia formosissima.* **Josephines-**: *Brunsvigia Josephinæ.* **Kafir-**: *Clivia, Schizostylis.* **Mariposa-**: *Calochortus.* **Mountain**: see *Ranunculus Lyallii.* **-of-the-Nile**: *Agapanthus umbellatus.* **-of-the-Valley**: *Convallaria.* **Plantain-**: *Hosta.* **Pond-, Yellow**: *Nymphozanthus.* **Prairie-**: *Cooperia.* **Rain-**: *Cooperia.* **St.-Bernard-**: *Anthericum Liliago.* **St.-Bruno-**: *Paradisea Liliastrum.* **St.-James-**: *Sprekelia formosissima.* **Sand-**: *Leucocrinum montanum.* **Scarborough-**: *Vallota speciosa.* **Sego-**: *Calochortus Nuttallii.* **Snake-**: *Brodiæa volubilis.* **Spear-**: *Doryanthes.* **Spider-**: *Hymenocallis.* **Star-**: *Leucocrinum montanum.* **Toad-**: *Tricyrtis.* **Torch-**: *Kniphofia.* **Triplet-**: *Brodiæa laxa.* **Trout-**: *Erythronium.* **-Turf**: *Liriope, Mondo.* **Water-**: *Nymphæa, Victoria.* **Zephyr-**: *Zephyranthes.*

LIMB: the expanded flat part of an organ; in particular, the expanding part of a gamopetalous corolla.

LIME: *Citrus aurantifolia*; see *Citrus Fruits* (page 156); also *Tilia.* **-Berry**: *Triphasia trifolia.* **Finger-**: *Microcitrus australasica.* **Spanish-**: *Melicocca bijuga.*

LIMEQUAT: see *Citrus Fruits* (page 157).

LIMNANTHACEÆ. LIMNANTHES FAMILY. Only 2 herbaceous genera native in N. Amer., having alternate dissected lvs., bisexual regular solitary fls. with 3–5 sepals and petals, twice as many stamens, superior ovary of mostly 5 carpels which separate into nutlets; allied to Geraniaceæ. Limnanthes only is cult.

LIMNANTHEMUM: *Nymphoides.*

LIMNANTHES. *Limnanthaceæ.* Ann. herbs with characters of the family, the parts of the fl. 4 or 5. Of easy cult. and propagated by seeds as a flower-garden subject.

Douglasii (*Floerkea Douglasii*). MEADOW-FOAM. To 1 ft.: lvs. finely 2-pinnatifid, yellowish-green: fls. white or pinkish and yellowish toward base, fragrant, sometimes white throughout, to 1 in. across. Calif. to Ore., in low ground, making great display in early spring.

LIMNIA: *Montia perfoliata.*

LIMNOBOTRYS: *Ribes lacustre.*

LIMNOCHARIS. *Butomaceæ.* Two trop. American aquatic herbs with basal lvs. and yellow fls. having 3 persistent sepals and 3 fugacious petals.

The plants are grown in tubs or pots or in shallow water out-of-doors. Propagated by seeds or by offsets or suckers from the flower-stem. Usually reproduces itself naturally.

emarginata: *L. flava.*

flava (*L. emarginata. L. Plumieri*). Standing 2 ft. out of water: lvs. lanceolate or broadly ovate, velvety-green: fls. about 1 in. across, in 2–12-fld. umbels at tip of scape. W. Indies to Brazil: tender N.

Humboldtii: *Hydrocleys nymphoides.*

Plumieri: *L. flava.*

LIMNORCHIS: *Habenaria.*

LIMODORUM TUBEROSUM: *Calopogon pulchellus.*

LIMONIUM (*Statice* of gardens). SEA-LAVENDER. SEA-PINK. *Plumbaginaceæ.* Ann. and per. herbs: lvs. radical and tufted or alternate along st. in shrubby forms: fls. in many species in loose panicles, in others in branching spikes, white, yellow, rose, lavender, blue: widely distributed but mostly sea-coast plants of the northern hemisphere.

The plants are grown in the border, rockery, greenhouse and for cut-flowers. The more dainty panicled kinds are as useful as gypsophila in mixed bouquets. The flowers may be dried for use with everlastings. They require the usual culture for perennials and annuals.

arborescens. Shrub to 2 ft.: lvs. ovate-oblong, to 6 in. long: branches of panicles winged; calyx blue; corolla yellow. Teneriffe.

Bonduellii. Ann. or bien. to 2 ft.: lvs. lyrate-pinnatifid, to 6 in. long: branches of panicles winged, forming linear appendages below the forks; calyx and corolla yellow. Algeria.

brassicæfolium. Subshrub to 1½ ft.: lvs. lyrate-pinnatifid, with 2–4 small side lobes: branches of panicles with broad wavy wings; calyx purple; corolla yellowish-white. Canary Isls.

californicum (*L. commune* var. *californicum. S. Limonium* var. *californicum*). Per. to 2 ft.: lvs. obovate, to 10 in. long: fls. violet-purple. Calif.

eximium (*Goniolimon eximium*). Per. to 2 ft.: lvs. oblong to obovate, wavy-edged: calyx green tipped white; corolla lilac-rose. Cent. Asia. Var. **alba** has white fls. and **superbum** larger heads.

fruticans (*S. arborea*). Shrub: lvs. ovate, to 2 in. long: branches of panicles with narrow wings; calyx blue; corolla yellow. Teneriffe.

Gmelini. Per. to 2 ft.: lvs. ovate or obovate: calyx dark purplish-blue; corolla rose. Caucasus, Siberia.

Gougetianum. Per. to 4 in.: lvs. evergreen, obovate, small and in dense rosettes: calyx reddish tipped white; corolla lavender. Italy.

hybridum: a name of uncertain application.

imbricatum. Subshrub to 1½ ft.: lvs. lyrate-pinnatifid, with 8–9 small side lobes: branches of panicles with broad wavy wings; calyx blue; corolla yellowish-white. Teneriffe.

incanum nanum: *L. tataricum* var. **nanum.**

latifolium. Per. to 2 ft., hairy: lvs. oblong-elliptic, to 10 in. long: calyx white; corolla blue. E. Eu., W. Asia. Var. **album** has white fls. and **roseum** rose. Var. **elegantissimum** is an improved form with larger fls.

leptostachyum. Ann., glaucescent: lvs. to ½ in. long, pinnate into linear segms.: fls. white. Persia.

lychnidifolium. Per. to 2 ft.: lvs. obovate-lanceolate, large, leathery: corolla rose. S. W. Eu., Morocco.

macrophyllum. Shrub to 3 ft.: lvs. obovate-spatulate, large: branches of panicles broad-winged; calyx blue or purple; corolla yellow to white. Teneriffe.

macropterum. To 2 ft.: lvs. lyrate-pinnatifid, large, leathery: branches of panicles broad-winged; fls. purple. Canary Isls.

perfoliatum. Per. to 2 ft.: lvs. oblong-spatulate, small: fls. white. Shores of Caspian Sea.

Perezii. Subshrub to 3 ft.: lvs. broadly triangular, to 6 in. long. with truncate base and long petioles: calyx purplish-blue; corolla pale yellow. Canary Isls.

Preauxii. Subshrub to 2 ft.: lvs. broadly triangular, to 4 in. long, with truncate base and long petioles: branches of panicles flattened; calyx lavender; corolla pale yellow. Canary Isls.

reticulatum. Per. to 8 in.: lvs. obovate to lanceolate, to 1½ in. long: calyx white; corolla pale lilac. Eu., E. Asia.

sinense. Per. to 1 ft.: lvs. obovate-lanceolate: calyx white or pale yellow; corolla yellow. China.

sinuatum. Per. or bien. to 2 ft.: lvs. lyrate-pinnatifid, to 8 in. long: branches of panicles 3–5-winged, forming linear-lanceolate appendages below the forks: calyx blue; corolla yellowish-white. Medit. region. Var. **candidissimum** has white fls.

spicatum. Ann. to 6 in.: lvs. oblong-lanceolate, pinnately lobed: fls. rose or white, in dense cylindrical spikes. W. Asia.

superbum. Hybrid between *L. Suworowi* and *L. leptostachyum*: ann. to 2½ ft.: fls. rose-red.

Suworowi. Ann. to 1½ ft.: lvs. basal, oblong-lanceolate, to 8 in. long: fls. in dense cylindrical spikes; calyx green tipped with lavender; corolla lavender. Turkestan. Var. **album** has white fls.

tataricum (*Goniolimon tataricum*). Per. to 1 ft.: lvs. obovate, to 6 in. long: branches of panicle with narrow wings; calyx white; corolla red. S. E. Eu. Var. **angustifolium** (*S. incana*) has lanceolate lvs. Var. **nanum** (*S. incana* var. *nana*) is dwarf.

vulgare (*S. Limonium*). Per. to 1 ft. or more: lvs. elliptic-oblong, to 6 in. long: calyx white or bluish; corolla bluish-lilac. Eu., N. Afr., Asia Minor.

LINACEÆ. Flax Family. Temp. and trop. herbs or shrubs of wide distribution, with usually alternate lvs., regular polypetalous fls. having an equal number of petals and stamens, superior 2–10-celled ovary, and fr. a caps. or drupe; 14 genera of which only Linum and Reinwardtia are cult. Aside from flax (*Linum usitatissimum*), the plants are of minor importance in cult., the others being grown for ornament in the open or under glass; the fls. are blue, red, or yellow, brilliant but mostly of short duration.

LINANTHUS. *Polemoniaceæ.* Ann. herbs with opposite lvs. commonly palmately divided to base into thread-like segms. and giving the appearance of whorls, and usually bearing funnelform or salverform fls. Grown in the flower-garden and propagated by seeds.

androsaceus (*Gilia androsacea*). To 1 ft.: fls. white, pink, violet or yellow, salverform, to 1 in. long, in dense heads. Calif.

densiflorus: *L. grandiflorus.*

dianthiflorus (*Gilia dianthoides. Fenzlia dianthiflora*). To 6 in., tufted: lvs. entire, thread-like, to 1 in. long: fls. lilac or pink varying to white, funnelform, ¾ in. long, in few-fld. clusters, the corolla-lobes toothed. S. to Lower Calif.

grandiflorus (*L.* and *Leptosiphon densiflorus. Gilia densiflora*). To 2 ft.: fls. lilac or pink to white, funnelform, to 1 in. long, in dense heads. Calif.

liniflorus (*Gilia liniflora*). To 1½ ft.: fls. white or blush, funnelform, ½ in. long, in a panicled cyme. Calif.

parviflorus (*Gilia micrantha*). To 1 ft. or less: fls. purple to pinkish, pale yellow or white, salverform, to 1½ in. long, in leafy clusters. Calif.—Forms of this species are sold as *Leptosiphon aureus, hybridus, luteus,* and *roseus.*

LINARIA. Toadflax. *Scrophulariaceæ.* Low ann. or per. herbs of north temp. zone: lvs. opposite, in whorls or the upper ones alternate, entire, toothed or lobed: fl.-racemes or spikes terminal and of many colors, the corolla-tube long-spurred at the base.

The linarias are of easy culture. The annuals are propagated by seeds, the perennials usually by division although seeds sown one year should produce flowering plants the following year.

æquitriloba: *Cymbalaria æquitriloba.*

alpina. Per. to 6 in., tufted: lvs. linear or lanceolate: fls. blue with orange palate, spur as long as corolla. Alps.

anticaria. Much branched per. with ascending sts. to 1 ft.: lvs. oblong or lanceolate: fls. white with blue throat, spur lilac and shorter than corolla. Spain.

aparinoides: *L. heterophylla.*

bipartita. Cloven-lip T. Ann. 1 ft.: lvs. linear: fls. violet-purple with orange palate, upper lip deeply 2-parted, spur curved, slightly shorter than corolla. Portugal, N. Afr. Var. **alba** has white fls. and **splendida** deep purple fls.

Broussonnetii (*L. multipunctata*). Ann. to 8 in.: lvs. lanceolate or linear: fls. yellow with orange throat and black spots, spur longer than corolla. Medit. region.

canadensis. Ann. or bien. to 2½ ft.: lvs. linear: fls. ¼ in. long, blue with white palate, spur filiform, curved, as long as corolla. N., Cent. and S. Amer.

Cymbalaria: *Cymbalaria muralis.*

dalmatica. Per. to 4 ft.: lvs. lanceolate, glaucous: fls. bright yellow, spur straight, shorter than corolla. S. E. Eu.

delphinioides: *L. sapphirina.*

Elatine: *Kickxia Elatine.*

genistifolia. Per. to 4 ft.: lvs. lanceolate: fls. citron-yellow with orange palate, to ¾ in. long, spur shorter than corolla. Eu.

hederæfolia: hort. name for a species of Cymbalaria.

Hendersoni: hort. name.

hepaticæfolia: *Cymbalaria hepaticæfolia.*

heterophylla (*L. aparinoides*). Ann. to 3 ft.: lvs. linear or lanceolate: fls. straw-colored with a yellow palate, 1 in. long. Morocco.

italica. Per. to 2 ft.: lvs. linear-lanceolate: fls. yellow, spur slightly shorter than corolla. Eu.

macedonica. Stout per. to 3 ft., grayish-green: lvs. ovate to lanceolate: fls. bright yellow marked with orange on palate, ¾ in. long, spur as long as corolla. Macedonia. Var. **speciosa** is showy and large-fld.

macroura. Per. to 2 ft., glaucous: lvs. oblong-linear: fls. yellow with orange palate, about 1½ in. long, spur as long as corolla. Caucasus.

maroccana. Ann. to 1½ ft.: lvs. narrow-linear: fls. bright violet-purple with small yellow patch on palate, spur pointed, half as long again as corolla. Morocco.

melanantha: *L. tristis.*

multipunctata: *L. Broussonnetii.*

origanifolia. Per. to 10 in.: lvs. oblong or obovate: fls. pale purple to white with yellow palate, ½ in. long, spur shorter than corolla. S. Eu.

pallida: *Cymbalaria muralis* var. *maxima.*

Pancici: hort. form, dwarf with large canary-yellow fls. Said to come from Orient.

Perezii: *L. Tournefortii.*

pilosa: *Cymbalaria pilosa.*

purpurea. Per. to 3 ft.: lvs. linear or linear-lanceolate: fls. bright purple with white-bearded palate, ⅓ in. long, spur curved and about length of corolla. S. Eu.

repens. Erect per., or decumbent at base, 1–2 ft., with creeping rootstocks: lvs. linear, mostly crowded near base and scattered above: fls. less than ½ in. long, white with purplish veins, fragrant. Eu.

reticulata. PURPLENET T. Ann. to 4 ft., glaucous: lvs. linear: fls. purple, netted-veined, palate orange or yellow, spur as long as corolla. Portugal, N. Afr. Var. **aureo-purpurea** is deeper in color.

sapphirina (*L. delphinioides*). Ann. to 1 ft.: lvs. linear: fls. blue, to ¾ in. long, spur much longer than corolla. Spain, Portugal.

spuria: *Kickxia spuria.*

striata: name of doubtful application; perhaps a form of *L. bipartita* is meant.

supina. Per. with decumbent sts. to 9 in. long: lvs. linear: fls. pale yellow, nearly 1 in. long, spur about length of corolla. Eu., nat. in E. U. S.

Tournefortii (*L. Perezii*). Ann. or per. to 1½ ft.: lvs. linear or lanceolate: fls. deep yellow with orange palate, spur about length of corolla. Spain.

triornithophora. Per. to 4 ft., glaucous: lvs. ovate-lanceolate: fls. violet striped purple with orange palate, 1½ in. long, spur longer than corolla. Spain, Portugal.

triphylla. Ann. to 2 ft., glaucous: lvs. ovate or oval: fls. yellowish-white with orange palate and violet curved spur, ¾ in. long. Medit. region.

tristis (*L. melanantha*). Per. to 1 ft.: lvs. linear-oblong: fls. brown or yellow with orange bearded palate, spur curved, shorter than corolla. Medit. region.

vulgaris. COMMON T. BUTTER-AND-EGGS. Per. to 3 ft.: lvs. linear: fls. yellow with orange bearded palate, 1¼ in. long, spur about length of corolla. Eu., Asia, nat. in N. Amer.

LINDELOFIA. *Boraginaceæ.* Erect per. herbs with alternate simple lvs. and blue or purple fls. like forget-me-not in dense long racemes.

One species is sometimes grown in rock-gardens. It thrives in any soil but requires a sheltered position and winter protection in the North. Propagated by division and seeds.

longiflora (*L. spectabilis*). To 1½ ft., leafy: lvs. lanceolate or oblong-lanceolate: fls. deep blue, ⅗ in. long, in racemes to 6 in. long. Himalayas.

spectabilis: *L. longiflora.*

LINDEN: *Tilia.*

LINDERA BENZOIN: *Benzoin æstivale.*

LINDLEYELLA: *Bifrenaria aurantiaca.*

LINEAR: long and narrow, the sides parallel or nearly so, as grass leaves.

LINNÆA. *Caprifoliaceæ.* A trailing evergreen subshrub suitable for the rock-garden where it thrives in moist peaty or woodsy soil. Propagated by division and cuttings under glass. **L. borealis.** TWINFLOWER. Lvs. opposite, roundish, to 1 in. long: fls. in pairs, bell-shaped, to ⅓ in. long, rose or white, fragrant: fr. yellow, ⅛ in. long. N. Eu., N. Asia, Alaska. Var **americana** (*L. americana*) differs in the more tubular fls. to ½ in. long. N. Amer.

LINOMA: *Dictyosperma.*

LINOSPADIX. *Palmaceæ.* Perhaps a dozen species in New Guinea, unarmed small monœcious palms with lvs. pinnate-ribbed, pinnatisect or pinnate: spadix among the lvs., simple, the fls. spirally arranged and immersed, in 3's, the middle one pistillate; stamens 6 or 9: fr. small, ellipsoid, with stigmatic point at apex. See *Palm* for cult.

Petrickiana. Lvs. bifid in juvenile form, later pinnate and arching; pinnæ about 30, narrow, long-acuminate, entire, strongly ribbed and nerved, more or less brown-scaly underneath. Described from juvenile specimens, and the botanical position uncertain.—Good tub plant, and will probably stand in S. Fla.

LINOSYRIS. *Compositæ.* Old World herbaceous perennials with alternate narrow lvs. and yellow heads of disk-fls. either solitary or in corymbose terminal clusters; pappus of bristles. Propagated by division and suited to any good soil.

vulgaris (*Aster Linosyris*). GOLDILOCKS. To 2 ft., glabrous: lvs. linear, 1 in. long, entire: heads about ½ in. across, corymbose, late summer or autumn. Eu.

LINUM (incl. *Cathartolinum*). FLAX. *Linaceæ.* Erect herbs or subshrubs with alternate narrow lvs., red, yellow, blue or white fls. with fugacious petals, 5-celled (or apparently 10-celled) ovary with 2 ovules in each cell and 5 styles; about 90 species chiefly in temp. regions, one (*L. usitatissimum*) furnishing fiber and linseed oil and others grown for the summer bloom. The foliage is very similar in most of the species, being small, narrow, sessile, usually entire.

The annuals may be grown from seeds sown where the plants are to stand. The perennials are propagated by seeds or division or by cuttings. They are of simple cultural requirements.

abyssinicum. Ann., erect: fls. yellow. Abyssinia.

alpinum. Per. to 6 in.: fls. blue, large. Eu.

americanum: unidentified name for an American plant.

angustifolium. Per. to 10 in.: fls. pale blue. Eu.

arboreum. Shrub to 1 ft.: fls. yellow, large. S. Eu.

austriacum. Per. to 3 ft.: fls. deep blue. S. Eu.

cæruleum. Probably a bluish form of *L. grandiflorum.*

campanulatum. Per. to 1 ft.: fls. pale yellow with orange veins, to 1¼ in. across. S. Eu.

capitatum. Per. to 9 in.: fls. golden-yellow. S. Eu.

coccineum: a color strain of *L. grandiflorum.*

corymbiferum. Bien.: fls. yellow, ½ in. across. N. Afr.

crepitans: *L. usitatissimum* var.

flavum. GOLDEN F. Per. to 2 ft.: lvs. flat and broad: fls. golden-yellow, ¾ in. across. Eu.—See also *Reinwardtia indica.*

gallicum. Ann. to 1½ ft.: fls. yellow, small S. Eu..

grandiflorum. FLOWERING F. Ann. to 2 ft.: fls. in shades of red, to 1½ in. across. N. Afr. Var. **coccineum** has scarlet fls. and var. **rubrum** bright red fls.

hirsutum. Per. to 2 ft.: fls. lilac, white at base. S. Eu.

hologynum. Bien. or per.: fls. bright rose-violet. S. E. Eu.

Lewisii. Prairie F. Per. to 3 ft.: fls. clear blue, 1½ in. across. W. N. Amer

monogynum. Per. to 2 ft.: fls. white, 1 in. across. New Zeal.

narbonense. Per. to 2 ft.: fls. azure-blue with white eye, to 1½ in. across. Eu.

nervosum. Per. to 1½ ft.: fls. blue, large. E. Eu.

perenne (*L. sibiricum*). Per. to 2½ ft.: fls. azure-blue, to 1 in. across. Eu. Var. **album** has white fls.

rubrum: *L. grandiflorum* var.

salsoloides. Evergreen per. to 8 in.: fls. white with purple center. S. Eu.

sibiricum: *L. perenne.*

sulcatum (*Cathartolinum sulcatum*). Ann. to 2 ft.: fls. yellow, ½ in. across. Ont. to Ga. and Tex.

tenuifolium. Per. to 1 ft. or more: fls. pink or lilac. S. Eu.

trigynum: *Reinwardtia indica.*

usitatissimum. Flax (which see). Ann. to 4 ft.: fls. blue or white, ½ in. across. Probably Asia; run wild in N. Amer. and Eu. Var. **crepitans** is lower with larger fls.

viscosum. Glandular-hairy per. to 2 ft.: fls. pink with violet veins, large. S. Eu.

LIONS-EAR: *Leonotis.*

LIP: one of the parts in an unequally divided corolla or calyx; these parts are usually 2, the upper lip and the lower lip, although one lip is sometimes wanting; the upper lip of orchids is by a twist of the stipe made to appear as the lower; a labium. Lipped or labiate corollas are characteristic of the Labiatæ.

LIPARIS. Twayblade. *Orchidaceæ.* Terrestrial herbs with bulbs at base of st., a few broad lvs. and fls. in terminal racemes, the sepals and petals nearly equal, the lip nearly flat; sometimes transplanted to the wild-garden. See *Orchids.*

liliifolia. To 10 in.: lvs. 2, to 6 in. long: fls. yellow veined with red, about ¾ in. across, in many-fld. racemes to 6 in. long, May–July. Me. to Ga. and Mo.

Loeselii. To 8 in.: lvs. 2, to 6 in. long: fls. yellowish-green, about ½ in. across, in 4–10-fld. racemes, May–July. N. Amer., N. Eu., N. Asia.

longipes: *L. viridiflora.*

viridiflora (*L. longipes*). Pseudobulbs to 4 in. high, with 2 lvs. to 6 in. long: fls. yellowish-white with green lip, very small, in many-fld. racemes to 10 in. long, Dec.–Jan. India, China.

LIPPIA. *Verbenaceæ.* Warm-temp. and trop. herbs and shrubs having mostly opposite or whorled lvs. and small white, rose or purplish fls. in heads or spikes.

One (*L. canescens*) is grown as a ground-cover in warm climates and the lemon-verbena is a popular greenhouse subject. The latter should be grown in a temperature of about 55° and the pots planted out in summer. Propagated by cuttings from the new growth. *V. canescens* is best increased by planting small sods a few feet apart.

canescens (*L. repens*). Creeping and spreading: lvs. opposite or whorled, oblong to lanceolate, to ¾ in. long, toothed toward tip: fls. lilac with yellow throat, in heads to ½ in. across. S. Amer.—Used as a lawn cover in S. Calif. and elsewhere.

citriodora (*Aloysia citriodora* and *triphylla*). Lemon-Verbena. Shrub to 10 ft.: lvs. in whorls of 3 or 4, lanceolate, to 3 in. long, entire or toothed, with odor of lemon: fls. white, in spikes or terminal panicles. Argentina, Chile.

ligustrina (*L. lycioides. Aloysia ligustrina*). Shrub to 14 ft.: lvs. opposite, oblong-lanceolate, to 1 in. long, entire: fls. white or tinged with violet, fragrant, in abundant spikes to 3 in. long. Tex. to Argentina.—Sometimes planted far S.

lycioides: *L. ligustrina.*

repens: *L. canescens.*

urticoides. Shrub to 10 ft.: lvs. opposite, ovate to oblong, to 3 in. long, toothed: fls. white, fragrant, in panicled spikes. S. Amer.

LIQUIDAMBAR. *Hamamelidaceæ.* Deciduous trees native in Asia and Amer., with palmately lobed toothed maple-like lvs., unisexual fls. without petals borne in globose heads, and fr. a dense spiny hanging head of compacted capsules. Propagated by seeds which may not germinate until the second year.

formosana. To 120 ft.: lvs. 3-lobed. China, Formosa; hardy only in southern states.

Styraciflua. Sweet Gum. To 140 ft., the branches becoming corky: lvs. 5–7-lobed. Conn. to Fla. and Mex.; reliably hardy only in its natural range.

LIQUORICE: *Glycyrrhiza.*

LIRIODENDRON. Tulip-Tree. *Magnoliaceæ.* Two deciduous trees native in N. Amer. and China, the former often planted: lvs. alternate, long-stalked, lobed and with broad truncate apex: fls. bell-shaped, solitary, terminal: fr. cone-like, of long narrow carpels.

Tulip-trees do not transplant readily, and the moving should be undertaken in spring. They thrive on rich moist land. Propagated by seeds stratified and sown in spring, or horticultural forms by layering and grafting.

Tulipifera. To 200 ft., with eventually columnar unbranched trunk: lvs. to 5 in. long and broad, pale beneath: fls. greenish-yellow with orange at base, to 2 in. long: fr. brown, to 3 in. long. Mass. to Fla. and Miss.—One of the noblest of American trees; sometimes known as Whitewood and to lumber dealers erroneously as "poplar." Var. **aureo-marginatum** has lvs. margined with yellow. Var. **integrifolium**, lvs. unlobed. Var. **pyramidale**, of narrow-pyramidal form.—The Chinese species, *L. chinense*, probably not in cult. in N. Amer. outside botanic gardens, is a much smaller tree with mostly more deeply lobed lvs. and somewhat smaller fls.

LIRIOPE. Lily-Turf. *Liliaceæ.* A few Asian species of stemless glabrous evergreen per. herbs, prized for their attractive grass-like foliage forming mats or sods and the small lilac-purple to whitish fls. which are sessile or ascending or erect, in spikes or racemes that may or may not overtop the clump; ovary superior; filaments equalling or exceeding the blunt anthers: fr. 1-seeded, berry-like, blue or black. The species make good ground-cover in both shade and sun, and are hardy in parts of N. Y. Propagated readily by division. See *Mondo.*

graminifolia: the plant grown under this name is *L. spicata*, the true *graminifolia* apparently not being in cult.

Muscari (*L. graminifolia* var. *densiflora*). Big Blue L. Root-system an upright stock, with thick tubers and many fibers: lvs. firm, to 18 in. long and to ½ or ¾ in. broad: scapes mostly not exceeding lvs., dense: fls. lilac-purple: fr. black. Japan, China.—There are cockscombed and fasciated forms. The plant sometimes passes as *Ophiopogon* (or *Mondo*) *Jaburan.* Var. **exiliflora** is a slender form with lax spikes. Var. **variegata** has lvs. yellow-striped.

spicata. Creeping L. Root-system shallow, with many slender jointed rootstocks and tubers: lvs. narrow, about ¼ in. or less broad, grassy: spike slender and open, light lilac to almost white: fr. becoming black. Japan, China.

LISTERA. *Orchidaceæ.* Small terrestrial orchids native in the north temp. zone, with 2 opposite lvs. and small fls. in terminal racemes, the sepals and petals similar, the lip entire or 2-lobed; sometimes planted in wild or protected places. See *Orchids.*

ovata. To 1½ ft.: lvs. broad-ovate, to 4 in. long: fls. green, about ⅓ in. long. Eu., Asia.

LITCHI. *Sapindaceæ.* One Chinese tree widely grown in warm regions for the edible fresh or dried fr., particularly prized in China. **L. chinensis** (*Nephelium Litchi*). LITCHI. LEECHEE. LYCHEE. To 40 ft.: lvs. of 2–4 pairs of oblong to lanceolate lfts. to 4 in. long, leathery and shining: fls. small, greenish-white or yellowish, in terminal panicles to 1 ft. long: fr. bright red, to 1½ in. across, covered with angular tubercles, the white flesh or aril juicy and edible, the seed single and large.—When well established, the litchi will stand a few degrees of frost. It requires abundant moisture and thrives on deep loamy soil. Trees should be set 30–40 ft. apart. Propagated by seeds, air-layering and inarching. The tree stands in S. Fla. and S. Calif.

LITHOCARPUS (*Pasania*). *Fagaceæ.* Oak-like evergreen trees native in Asia and W. N. Amer., with alternate lvs., unisexual fls. in erect catkins, and fr. a solitary nut partly or wholly inclosed by a cup-like spineless involucre. Sometimes grown in the S. and Calif. Propagated by cuttings, layers, or seeds. The species have also been named in Quercus.

cleistocarpa. Lvs. to 5 in. long, entire, glaucescent and becoming glabrous beneath. China.

cornea (*Quercus cornea*). Lvs. to 4 in. long, toothed above the middle, usually only pubescent on veins beneath. China.

densiflora (*Quercus densiflora*). TANBARK OAK. Tree 60 or 80 ft., sometimes 150 ft.: lvs. to 5 in. long, toothed, rusty-tomentose beneath but becoming glabrous. Ore., N. Calif.

edulis. Lvs. to 6 in. long, entire, glabrous. Japan.

glabra (*L. thalassica. Quercus glabra*). Lvs. to 5 in. long, entire or sometimes toothed toward tip, grayish-tomentose beneath. China, Japan.

Henryi. Lvs. to 10 in. long, entire, becoming glabrous beneath. China.

thalassica: *L. glabra.*

LITHODORA. *Boraginaceæ.* Usually included in Lithospermum but differing in the shrubby habit and technical characters of the fls. and nutlets; native in W. Medit. region.

diffusa (*Lithospermum diffusum* and *prostratum*). Dwarf or prostrate evergreen subshrub: lvs. linear-lanceolate: fls. deep blue striped with reddish-violet, ½ in. long. S. Eu.

fruticosa (*Lithospermum fruticosum*). To 10 in.: lvs. narrow, revolute, white-tomentose beneath: fls. blue. S. Eu.—The plant commonly cult. under this name is *L. diffusa.*

LITHOFRAGMA. *Saxifragaceæ.* Per. simple-stemmed rather small herbs with tuberous rootstocks, sometimes named in Tellima: fls. small, white or pink, with clawed petals and 3 styles, in simple terminal racemes: lvs. mostly radical, nearly orbicular or very broad. A few species in W. N. Amer., useful in wild-gardens and rockeries.

affinis (*Tellima affinis*). WOODLAND STAR. To 16 in., glandular-hairy: lvs. crenately lobed, often bronzed: fls. white. Calif.

LITHOPS. STONEFACE. *Aizoaceæ.* Segregates from the great group Mesembryanthemum (which see), native in S. Afr.: lvs. thick, in pairs, mostly buried as they grow in nature, the exposed top flat or concave and stone-like as if a single st. or body with a fissure across the top, in the juvenile state with only a central orifice at the apex after the manner of Conophytum: fl. solitary, yellow or white, issuing from the fissure, the petals many and tube none; stamens numerous in an erect column; stigmas 4–7. The plants resemble pebbles when not in bloom. Apparently not any of the species are in the trade in N. Amer., but a few kinds are known to fanciers; they will be special oddities.

LITHOSPERMUM. GROMWELL. *Boraginaceæ.* Ann. and per. hairy herbs, or sometimes subshrubs, mostly in northern hemisphere, with alternate entire lvs. and white, yellow, blue or violet fls. in bracted racemes or spikes; corolla funnelform or salverform, naked in throat, often showy; planted in rock-gardens and borders. Propagated by seeds and cuttings.

angustifolium (*L. linearifolium*). Per. to 2 ft.: lvs. linear: fls. of two kinds, the earlier ones bright yellow, to 1 in. long, later fls. pale yellow. Ind. to B. C. and Ariz.

canescens. PUCCOON. Per. to 1½ ft., hairy: lvs. oblong to linear: fls. orange-yellow, ½ in. long. Ont. to Tex.

diffusum: *Lithodora diffusa.*

distichum. Per., erect, silky-hairy: lvs. oblong-lanceolate: fls. white with yellow throat. Mex.

fruticosum: *Lithodora fruticosa.*

graminifolium: *Moltkia suffruticosa.*

hirsutum: listed name.

intermedium. Subshrub to 10 in.: lvs. narrow, slightly hoary: fls. blue, drooping. Of uncertain botanical position.

linearifolium: *L. angustifolium.*

multiflorum. Per. to 2 ft.: lvs. linear or linear-lanceolate: fls. light yellow, ½ in. long. Wyo. to Mex.

officinale. Per. to 4 ft.: lvs. lanceolate or ovate-lanceolate: fls. yellowish-white, ⅙ in. long. Eu.; nat. in E. U. S.

petræum: *Moltkia petræa.*

prostratum: *Lithodora diffusa.*

purpureo-cæruleum. Per. with procumbent sts. to 2 ft. long: lvs. lanceolate: fls. rich blue, ½ in. across. Eu.

sibiricum: *Mertensia sibirica.*

tenuiflorum. Sts. decumbent, to 1 ft. long: lvs. oblong-linear: fls. blue or rarely white, ¼ in. long. S. E. Eu. to W. Asia.

LITHRÆA. *Anacardiaceæ.* Evergreen trees and shrubs with leathery simple or pinnate lvs., small fls. in panicles, 10 stamens, fr. a 1-celled drupe; 3 species in S. Amer., planted in Calif. for ornament.

caustica. Shrub: lvs. simple, oval or oblong-ovate: fls. white: fr. white and lustrous, small. Chile.

molleoides. Shrub to 12 ft.: lvs. pinnate, of 3–5 lfts.: fls. greenish or whitish: fr. whitish and lustrous, small. S. Brazil, Argentina, Bolivia.

LITSEA. *Lauraceæ.* Diœcious trees and shrubs mostly of the Old World tropics, having commonly alternate lvs., small fls. in umbels, and fr. a berry; sometimes planted in S. Calif.

calicaris. Tree to 40 ft.: lvs. ovate to ovate-oblong, to 5 in. long, entire: umbels in racemes: fr. reddish, ¾ in. long. New Zeal.

ferruginea. Tree to 80 ft.: lvs. oblong, to 7 in. long, red-tomentose on nerves beneath: fr. globose, small. Singapore, Java.

LITTÆA HYSTRIX: *Agave stricta.*

LIVE-FOR-EVER: *Sedum.*

LIVERLEAF: *Hepatica.*

LIVING ROCK: *Roseocactus fissuratus.*

LIVISTONA. *Palmaceæ.* Two dozen hermaphrodite more or less ringed fan-palms in trop. Asia, Malaya, Philippines, New Guinea, and Australia, unarmed except on the petioles of some species, mostly tall, with branching long-peduncled spadices among the heavy foliage: lvs. more or less orbicular, plicate, deeply cut into narrow often bifid lobes: fls. small, numerous; stamens 6, filaments united: fr. drupe-like, small, globose or somewhat oblong, with thin flesh, variously colored; seed 1. The Livistonas are sometimes yet known to planters as Corypha. The species are much confused among cultivators, particularly the immature plants. Only one of the Livistonas is much known in the U. S. For cult. see *Palm.*

altissima: *L. rotundifolia.*

australis (*Corypha australis*). To 60 or 80 ft., bearing a dense crown: lvs. orbicular in outline, 3–5 ft. across, divided to middle into narrow entire or bifid lobes, without threads between the lobes when mature; petiole broad at base, to 5 ft. long, bearing stout short curved spines: spadix much branched, glabrous, spathe densely tomentose: fr. spherical, ½–¾ in. diam. Australia.

chinensis (*L. olivæformis*). Chinese Fan or Fountain Palm. Trunk stout and obscurely ringed, 20–30 ft., bearing a heavy dense globular crown with the lower lvs. declined or hanging: lf.-blade 3–6 ft. across, rotundate-reniform, cut one-third to one-half the depth into many narrow 1-ribbed segms. which in young plants are bifid an in. deep but on mature trees are parted a ft. or two deep and the narrow parts hang like a fringe; filaments usually none; petiole 2–6 ft. long, armed below with small spines (which may disappear): spathes scurfy: fr. olive-form, about ½ in. long, dull blue. Cent. China. Var. **subglobosa** (*L. subglobosa*), fr. globose, little if any longer than thick.—The Chinese fan palm is the commonest palmate palm in cult. in N. Amer., being prized as a tub plant and for decorations as well as an outdoor tree in most regions where palms will grow. It is very easy of cult. The plant is still sometimes known by the misapplied name *Latania borbonica:* this name should now be dropped from the lists.

cochinchinensis (*L. Hoogendorpii*). Tall and relatively slender, to 40 or 50 ft., the lf.-bases soon falling and leaving triangular scars: lvs. dark green, 3–6 ft. across; pinnæ very deeply bifid, with 2 strong side ribs; petiole bearing many dark colored very stout long sometimes branched spines or thorns that are thickened at base: fr. globose or somewhat broader than long, about ½ in. diam., blue. Malaya.

decipiens. Small or medium-sized palm making a loose open head: lf.-blade 2–5 ft. across, somewhat glaucous underneath, cut to the base into many narrow deeply bifid pendent segms.; petiole slender, bearing scattered small prickles: fr. spherical, about ½ in. diam. Probably Australian.

Hoogendorpii: *L. cochinchinensis.*

humilis. Low, trunk 6–15 ft.: lvs. rather small, blade about 1½ ft. in radius, rather stiff, deeply divided, filaments very short or wanting; petiole bearing small prickles: fr. ovoid-oblong, about ⅔ in. long. Australia.—Decorative when young.

Jenkinsiana. To 30 ft.: lvs. 5–6 ft. across, glaucous underneath; segms. 70–80, very narrow, shortly bifid; petiole spiny whole length: fr. 1 in. or less diam., blue. Assam.

Mariæ. To 40 ft., bearing a loose head: lvs. glaucous, when young the petiole and blade red or tinged; blade 3–6 ft. long, nearly orbicular and contracted toward base, split to middle and beyond, with a thread in each sinus; segms. deeply bifid, but the segm. itself rather than its lobes hanging; petiole with many stout but short spines: fr. spherical, about ½–¾ in. diam. Inland palm in Australia.

olivæformis: *L. chinensis.*

rotundifolia (*L. altissima. Corypha rotundifolia*). Trunk to 80 ft. and more, rather slender, obscurely ringed: lf.-blade nearly orbicular, with short segms. bifid at apex; petiole of young lf. bearing spines, that of older lvs. nearly to quite spineless: fr. spherical, about ¾ in. long, black, Malayan region; variable.

subglobosa: *L. chinensis* var.

LIZARDS-TAIL: *Saururus.*

LOASA. *Loasaceæ.* Herbs or subshrubs native in S. Amer. and Mex., usually with stinging hairs, the fls. yellow, white or red, with hooded petals and colored nectar-scales so that the coloration may be complex, and fr. a caps.; sometimes grown in flower-gardens. Propagated by seeds and cuttings.

aurantiaca: *Caiophora lateritia.*

hispida: *L. urens.*

lateritia: *Caiophora lateritia.*

tricolor. Ann. to 2 ft.: lvs. opposite, 2-pinnate: fls. yellow with a red crown and white stamens. Chile.

triphylla. To 1½ ft.: lvs. alternate, 3- or rarely 4–5-lobed: fls. few. Peru.

urens (*L. hispida*). Ann. to 1½ ft.: lvs. alternate, pinnatifid: fls. yellow, 1 in. across. Peru.

vulcanica (*L. Wallisii*). Ann. to 3 ft.: lvs. palmately 3–5-lobed: fls. white with deep yellow crown barred with red and white. Ecuador, Colombia.

Wallisii: *L. vulcanica.*

LOASACEÆ. Loasa Family. Mostly herbaceous sometimes twining plants, of 13 genera mostly in N. and S. Amer., usually armed with rough bristly and often stinging hairs: fls. regular and bisexual, polypetalous, having 4–5 sepals and petals, numerous stamens, inferior 1–3-celled ovary, and capsular fr. Species cult. for ornament are in the genera Blumenbachia, Caiophora, Loasa, Mentzelia.

LOBE: any part or segment of an organ; specifically a part of petal or calyx or leaf that represents a division to about the middle more or less.

LOBELIA. *Lobeliaceæ.* Ann. and per. herbs with alternate lvs., fls. in terminal racemes, spikes or panicles, the corolla-tube split down one side and the 5-lobed limb 2-lipped, and capsular frs.

Lobelias are grown in borders and the flower-garden. The native perennial horticultural species thrive in moist locations. Seeds of the annual kinds sown in early winter will produce flowering plants by April or May. Propagated also by cuttings, and the perennials by division.

cardinalis. Cardinal-Flower. Indian-Pink. Per. to 3 and 4 ft., glabrous: lvs. oblong-ovate or -lanceolate, toothed: fls. bright cardinal, to 1½ in. long. N. B. to Fla. and Tex.

Cavanillesii: *L. laxiflora* var. *angustifolia.*

Erinus. Edging L. Ann. to 1 ft., partially trailing, nearly glabrous: lvs. obovate to linear, toothed: fls. pale blue or violet with white or yellowish throat, to ¾ in. across. S. Afr. Some of the hort. vars. are: **alba**, fls. white; **compacta**, low and dense; **erecta**, of low compact habit; **flore-pleno**, fls. double; **gracilis**, sts. long and slender; **kermesina**, fls. crimson; **Lindleyana**, fls. rose with white throat; **Paxtoniana**, fls. light blue with white throat; **pumila**, very dwarf; **speciosa**, fls. azure-blue with white throat.

fulgens. Per. to 3 ft., usually pubescent and tinged brown or bronze: lvs. lanceolate, toothed: fls. deep red, about 1½ in. long. Mex.

Gerardii. Hybrid between *L. siphilitica* and a form of *L. fulgens:* fls. rich violet, 1½ in. long. Var. lugdunensis has rose-colored fls.

gracilis. To 1 ft., glabrous: lvs. ovate to linear, the lower pinnatifid: fls. blue with whitish throat, to ¾ in. across. Australia.

heterophylla. Resembling *L. gracilis* but with larger fls. and winged seeds. Australia.

hybrida. A group name comprising garden hybrids between various or several species.

inflata. INDIAN TOBACCO. Ann. to 3 ft., hairy: lvs. oval to ovate-lanceolate, toothed: fls. light blue, ¼ in. long: caps. inflated. Lab. to Ga. and Ark.

laxiflora. Per. to 5 ft., hairy: lvs. lanceolate or ovate-lanceolate, toothed: fls. red and yellow, 1½ in. long, cylindric, stamens exserted at one side. Mex. Var. angustifolia (*L. Cavanillesii*) has lanceolate to linear lvs.

ramosa: *L. tenuior.*

siphilitica. Per. to 3 ft., nearly glabrous: lvs. oblong-oval to lanceolate, toothed: fls. deep blue or purplish, 1 in. long. Me. to La. Var. alba has nearly white fls.

splendens. Per. to 4 ft., nearly glabrous: lvs. linear or linear-lanceolate, toothed: fls. deep red. Tex. to Mex.

tenuior (*L. ramosa*). Ann. to 1½ ft., pubescent; lvs. ternately divided or upper entire: fls. bright blue, 1 in. long. Australia.

triquetra. Ann. to 2 ft.: lvs. linear-lanceolate, toothed: fls. blue, small. S. Afr.

Tupa. Per. or subshrub to 7 ft.: lvs. oblong-oval, toothed, tomentose and wrinkled: fls. blood-red, 2 in. long, the lobes of the corolla united at tips. Chile.—Grown in Calif.

LOBELIACEÆ. LOBELIA FAMILY. About 20 genera of herbs, shrubs or trees of wide distribution, separated from the closely related Campanulaceæ chiefly because of the irregular fls. and the anthers united into a ring or tube. A few genera are grown for ornament, as Centropogon, Downingia, Isotoma, Lobelia, Palmerella, Pratia.

LOBIVIA. *Cactaceæ.* About 20 species of Peru, Bolivia and Argentina, differing from Echinopsis (among other things) by fl. short-funnelform to bell-shaped and the tube short. See *Cacti.*

Pentlandii (*Echinopsis Pentlandii*). Simple, ellipsoidal, to 6 in. diam., often somewhat glaucous, ribs about 12, spines 5–8 and all radial, about 1 in. or less long: fls. about 1½ in. long, rose-colored inside. Bolivia.

LOBULARIA (*Koniga*). *Cruciferæ.* A few Medit. per. herbs and subshrubs differing from Alyssum in clear white fls. and in technical points; one is a favorite flower-garden subject.

maritima (*Alyssum maritimum*). SWEET ALYSSUM. Per. but grown as an ann., sometimes escaped, passing the winter in mild climates, diffuse and much spreading, rising to 1 ft.: lvs. lanceolate to linear, entire, 1–3 in. long: fls. small but many in lengthening racemes, white but sometimes running to violet, fragrant, produced over a long season.—There are many forms in cult., as Benthami, Compacta, Gigantea, Minimum, Tom Thumb, also with variegated lvs. and double fls.; sometimes grown under glass. Raised from seeds.

LOCHNERA: *Vinca rosea.*

LOCKHARTIA. *Orchidaceæ.* Trop. American epiphytes with leafy sts. and fls. mostly in a lateral infl., the sepals and petals nearly equal, the lip 3-lobed; for cult. see *Orchids.*

elegans. Sts. to 3 in., thickly covered with lvs. about ½ in. long: fls. small, 1–2 together, yellowish-green with yellow lip spotted with violet, June–July. Trinidad.

LOCO WEED: *Oxytropis Lambertii.*

LOCUST: *Robinia.* Honey: *Gleditsia.* Swamp: *Gleditsia aquatica.* Sweet: *Gleditsia triacanthos.* Water: *Gleditsia aquatica.* West Indian: *Hymenæa Courbaril.*

LODOICEA. DOUBLE COCONUT. *Palmaceæ.* One diœcious unarmed fan-palm of the Seychelles, not regularly planted in the U. S. and little known in cult. under glass but of interest because of the huge 2-lobed drupe that reaches a length of 18 in. and contains 1 great 2-lobed seed and is one of the most remarkable frs. of the vegetable world. The staminate fls. are borne underneath scales in a dense catkin-like spike 2–6 ft. long and 4–5 in. thick; pistillate fls. on an open spike 4–6 ft. long; all spadices are borne in the lf.-axils, and on low trees the great frs. may rest on the ground. The lvs. are several ft. across, thick and heavy, on petioles 5–10 ft. long. The tree rises to 100 ft. in its native place. The floating nuts were once supposed to come from the Maldive Isls., an error preserved in the name L. maldivica (*L. seychellarum*). It may be able to stand under lath or in protected places in S. Fla.

LOESELIA. *Polemoniaceæ.* Herbs or sometimes subshrubs with alternate or opposite toothed lvs. and red or violet bright funnelform fls. solitary or in clusters; grown in the open in warm climates and under glass; Tex. and Calif. to S. Amer.

coccinea: *L. mexicana.*

mexicana (*L. coccinea*). Attractive per. to 3 ft.: lvs. oval to lanceolate, to 2 in. long: fls. tubular, brilliant rose-red, 1 in. long. Mex.

LOGANBERRY. A blackberry-like red acid fruit (*Rubus loganobaccus*) originated in California, with very long prostrate canes, much grown in Oregon and other parts of the Pacific coast country. The loganberry is used in the canned and dried product and in fruit juice. The plant is propagated by rooting tips. It is grown in rows 6 feet or more apart and usually trained on wires after the manner of dewberries. In the rows the plants are 8 feet or more apart, as it is a long and vigorous grower. The loganberry is not hardy in the northeastern states although the roots may pass the winter.

LOGANIA. *Loganiaceæ.* Herbs or shrubs with opposite lvs., small white or pink fls. mostly in terminal cymes or panicles, and capsular dehiscent frs.; native in Australia and 1 in New Zeal.

longifolia. Shrub to 6 ft. or more: lvs. elliptic or lanceolate, to 3 in. long: fls. in leafy panicles. Australia; intro. in Calif.

LOGANIACEÆ. LOGANIA FAMILY. About 30 genera of herbs, shrubs and trees widely distributed in warm and trop. regions of both hemispheres, having commonly opposite simple lvs., bisexual regular gamopetalous fls.

in panicles, cymes, heads or spikes, or sometimes solitary, with 4–5-lobed calyx and corolla, 4–5 stamens, superior 2-celled ovary, and fr. a caps., berry or drupe. Several genera yield drugs and poisons and others are grown for ornament, as Buddleja, Desfontainea, Gelsemium, Geniostoma, Logania, Spigelia, Strychnos.

LOGWOOD: *Hæmatoxylum campechianum.*

LOISELEURIA. ALPINE-AZALEA. *Ericaceæ.* One depressed glabrous evergreen subshrub, **L. procumbens,** of circumpolar regions, extending southward to the White Mts. and Mt. Katahdin, useful in alpine-gardening and cold rockery: 6–8 in., making mats: lvs. mostly less than ¼ in. long, oblong, revolute: fls. very small, white or rose.

LOLIUM. RYE-GRASS. *Gramineæ.* Small ann. and per. grasses grown in pastures and meadows, native in the Old World: lvs. flat: spikelets flat, in terminal interrupted spikes. See *Grasses.*

italicum: *L. multiflorum.*

multiflorum (*L. italicum*). ITALIAN R. Per. to 3 ft.: lvs. to 8 in. long and ⅜ in. wide: spikelets 20–30-fld., awned, in spikes to 1 ft. long. Eu.; nat. in N. Amer.

perenne. PERENNIAL or ENGLISH R. Tufted per. to 2½ ft.: lvs. to 5 in. long and ⅛ in. wide: spikelets 5–10-fld., awnless, in spikes to 1 ft. long. Eu., Asia; nat. in N. Amer.

temulentum. DARNEL. Per. to 4 ft.: lvs. to 10 in. long and ¼ in. wide: spikelets 4–8-fld., shorter than the outer glume, in spikes to 1 ft. long. Eu.; nat. in N. Amer.

LOMARIA: *Blechnum.*

LOMATIA. *Proteaceæ.* Trees or shrubs with alternate, entire or pinnate lvs., bisexual fls. borne in pairs in simple or branched loose racemes, and fr. a leathery follicle; differs from Grevillea in having several instead of 2 seeds. Native in Australia and Chile and requiring cool greenhouse treatment, or grown out-of-doors in warm regions. Propagated by cuttings of well-ripened wood.

fraxinifolia. Small tree: lvs. pinnate into 3–7 ovate or ovate-lanceolate toothed stalked segms. to 3 in. long, leathery and shining: racemes to 8 in. long. Australia.

ilicifolia. Shrub or small tree: lvs. ovate to lanceolate, to 3 in. or more long, prickly-toothed or lobed, silky-pubescent beneath, rarely pinnate. Australia.

obliqua. Lvs. ovate, to 4 in. long, crenate-toothed, bright green and leathery: fls. white, about ⅓ in. long. Chile.

silaifolia. Shrub to 3 ft.: lvs. to 8 in. long, 2–3-pinnate into linear or lanceolate toothed sessile segms. Australia.—Dyed sprays are employed by florists and decorators, as "crinkle-bush."

LOMATIUM (*Cogswellia*). *Umbelliferæ.* Short-stemmed or stemless per. herbs with thickened roots, dissected lvs., small yellow, white or purple fls. in umbels, and flattened frs.; mostly native in W. N. Amer.; sometimes planted in wild-gardens or similar places.

ambiguum. To 1 ft.: lvs. 1–2-pinnate into linear lfts.: fls. yellow. B. C. to Ore. and Utah.

LONAS. *Compositæ.* One branching ann. to 1 ft. high, native in the Medit. region, and sometimes grown for ornament. **L. inodora** (*Athanasia annua*). AFRICAN DAISY. Lvs alternate, pinnately divided into linear entire segms.: heads ⅜ in. across, of yellow disk-fls., borne in dense corymbs to 2 in. across; pappus cup-shaped.

LONCHOCARPUS. LANCE-POD. *Leguminosæ.* Trop. trees or climbing shrubs with alternate pinnate lvs., papilionaceous white, violet or purple fls. in racemes, and flat few-seeded indehiscent pods; sometimes planted in warm regions.

speciosus: *Bolusanthus speciosus.*

violaceus. Tree to 12 ft.: lfts. ovate, commonly 4 pairs: fls. violet. Farther W. Indies.

LONDON PRIDE: *Saxifraga umbrosa.*

LONGAN: *Euphoria Longana.*

LONICERA. HONEYSUCKLE. *Caprifoliaceæ.* Many erect or climbing neat shrubs with opposite short-stalked or sessile lvs., rather small but showy fls. in axillary pairs subtended by 2 bracts and 4 bractlets, or in sessile whorls, followed by attractive berry-like often twin frs., widely spread in northern hemisphere. The name honeysuckle is sometimes applied erroneously to native azaleas (rhododendrons).

Honeysuckles are very popular ornamental subjects and most of them are hardy North with the exception of the Himalayan species which require winter protection. They thrive in any good garden soil. Propagated by seeds in autumn or stratified, by cuttings of ripe wood, by layers, or by cuttings of green wood under glass

Alberti: *L. spinosa* var.

albida: *L. bella* var.

albiflora. Somewhat climbing: lvs. oval or ovate, to 1½ in. long: fls. yellowish-white, 2-lipped, 1 in. long, in clusters, spring: fr. orange. Ark., Tex.

alpigena. To 10 ft.: lvs. elliptic to oblong, to 4 in. long: fls. yellowish tinged red, 2-lipped, ½ in. long, in pairs, May: fr. scarlet. Eu.

Altmannii. To 6 ft.: lvs. ovate, to 2 in. long, pubescent beneath: fls. whitish, 2-lipped, ½ in. long, in pairs, May: fr. orange-red. Turkestan.

americana. Hybrid between *L. Caprifolium* and *L. etrusca:* climbing: lvs. oval or obovate, to 4 in. long, the upper connate: fls. yellowish, purple outside. 2-lipped, 2 in. long, in whorls, fragrant, June–July.

amœna. Hybrid between *L. tatarica* and *L. Korolkowii:* lvs. ovate, to 2 in. long: fls. pink or white, 2-lipped, ¾ in. long, in pairs, May–July.

bella. Hybrid between *L. tatarica* and *L. Morrowi:* lvs. ovate, to 2 in. long: fls. white or pink changing to yellow, 2-lipped, ½ in. long, in pairs, May–July: fr. red. Var. **albida** (*L. albida*) has white fls.

brachypoda: *L. japonica* var. *repens.*

Brownii. Hybrid between *L. sempervirens* and *L. hirsuta,* and closely resembling the former but the fls. somewhat 2-lipped. Var. **fuchsioides** (*L. fuchsioides*), fls. scarlet outside. Var. **punicea,** fls. orange-red.

cærulea (*Xylosteon cæruleum*). To 5 ft., much branched: lvs. ovate to oblong, to 3 in. long, bright green: fls. yellowish-white, ½ in. long, paired, Apr.–May: fr. dark blue and bloomy. Eu., Asia; nat. N. Amer. Var. **altaica** has lvs. pubescent on both sides. Var. **graciliflora** (*L. Karelini*) has bluish-green pubescent lvs. less than 2 in. long. Turkestan. Var. **viridifolia** (*L. Kirilowii*) has bright green smaller lvs.

californica: *L. hispidula* var. *vacillans.*

canadensis (*L. ciliata*). FLY H. To 5 ft.: lvs. ovate or oval, to 3 in. long, ciliate: fls. yellowish or tinged red, to ¾ in. long, paired, Apr.–May: fr. red. Que. to Pa. and Minn.

Caprifolium. Twining to 20 ft.: lvs. oval, to 4 in. long, bluish-green beneath, the upper connate: fls. white or purplish, 2-lipped, 2 in. long, fragrant, in whorls, May–June: fr. orange-red. Eu., W. Asia; nat. in E. U. S.

caucasica: *L. orientalis* var.

chinensis: *L. japonica* var.

chrysantha. To 12 ft.: lvs. ovate to ovate-lanceolate, to 5 in. long: fls. yellowish-white changing to yellow, 2-lipped, to ¾ in. long, in pairs, May–June: fr. coral-red. Asia. Var. **latifolia** (var. *turkestanica*) has broad-oval lvs.

ciliata: *L. canadensis.*

confusa. Twining, partially evergreen: lvs. ovate, to 2½ in. long, gray-green and pubescent beneath: fls. white changing to yellow, 2-lipped, to 1¾ in. long, fragrant, in short panicles, June–Sept.: fr. black. China.

conjugialis. Erect and much branched, to 5 ft.: lvs. elliptic to obovate, to 2 in. long, acute, ciliate: fls. dark red, about ⅓ in. long, June: fr. red. Nev. to Calif. and Wash.

demissa. To 12 ft., much branched: lvs. obovate, to 1¼ in. long, pubescent: fls. whitish changing to yellow, 2-lipped, ½ in. long, in pairs, May–June: fr. scarlet. Japan.

dioica (*L. glauca. L. parviflora*). Branches often twining: lvs. oval or oblong, to 3 in. long, glaucous beneath, upper pair connate: fls. greenish or yellowish, 2-lipped, ½ in. long, in whorls, May–June: fr. red. Que. to N. C. and Ia.

etrusca. Climbing, evergreen or partially so: lvs. obovate or oval, to 3 in. long, glaucous and pubescent beneath, upper connate: fls. yellowish-white, 2-lipped, 2 in. long, fragrant, in dense spikes, June–July. Medit. region. Var. **pubescens** has lvs. pubescent on both sides. Var. **superba** (*L. gigantea*) has large lvs. and deep yellow fls.

flava. Climbing: lvs. oval, to 3 in. long, bluish-green beneath, upper connate: fls. orange-yellow, 2-lipped, 1¼ in. long, fragrant, in whorls, May–June. N. C. to Okla.

fragrantissima (*L. Magnevilleæ. L. odoratissima*). To 8 ft., partially evergreen: lvs. ovate or oval, to 3 in. long, bluish-green beneath: fls. creamy-white, 2-lipped, ½ in. long, very fragrant, in pairs. Mar.–Apr.: fr. red. China.—Fls. partly or wholly in advance of lvs. where deciduous.

fuchsioides: *L. Brownii* var.

gigantea: *L. etrusca* var. *superba.*

Giraldii. Climbing: lvs. oblong-lanceolate, to 3 in. long, pubescent: fls. purplish-red with yellow pubescense outside, ¾ in. long. June–Aug.: fr. purple-black. China.

glauca: *L. dioica.*

gracilipes. To 6 ft.: lvs. ovate, to 3 in. long, bluish-green beneath: fls. pink to carmine, ½ in. long, usually solitary and drooping, Apr.–May: fr. scarlet. Japan.

Halliana: *L. japonica* var.

Heckrottii. Probably hybrid between *L. americana* and *L. sempervirens:* lvs. oval, to 2 in. long, glaucous beneath: fls. purple outside, yellow inside, 2-lipped, to 2 in. long, in spikes, June–Sept.

Henryi. Twining or prostrate, partially evergreen: lvs. oblong-lanceolate, to 3 in. long, ciliate: fls. yellowish- or purple-red, to ¾ in. long, in pairs, June–Aug.: fr. black. China.

Hildebrandiana. Climbing, evergreen: lvs. ovate, to 6 in. long: fls. yellow changing to orange-red, to 7 in. long, the tube very slender. Burma; not hardy N.; thrives in S. Calif.

hirsuta. Climbing: lvs. oval, to 4 in. long, gray-pubescent beneath, upper connate: fls. orange-yellow, 2-lipped, 1 in. long, in short spikes, June–July: fr. red. Que. to Pa. and Neb.

hispidula. Branches sarmentose: lvs. ovate or ovate-oblong, to 2½ in. long, pubescent beneath, upper connate: fls. whitish or purplish, 2-lipped, ½ in. long, in whorls, June–July: fr. red. B. C. to Calif. Var. **vacillans** (*L. californica*) is more vigorous with larger lvs. and fls.

iberica. To 6 ft., much branched: lvs. orbicular-ovate, to 1½ in. long, hairy: fls. yellowish-white, 2-lipped, ½ in. long, in pairs, June: fr. bright red. W. Asia.

implexa. Twining or bushy, evergreen: lvs. ovate or oblong, to 3 in. long: fls. yellowish-white tinged red, 2-lipped, to 1¾ in. long, in whorls, June–Aug. Medit. region.

involucrata (*Distegia involucrata*). To 3 ft.: lvs. ovate to oblong-lanceolate, to 5 in. long: fls. yellow or tinged red, ½ in. long, in pairs, May–June: fr. purple-black, shining. Que. to Alaska and Mex. Var. **flavescens,** lvs. light green. Var. **serotina,** fls. orange-yellow tinged scarlet.

japonica. Climbing, wholly or partially evergreen: lvs. ovate, to 3 in. long: fls. white or purplish, 2-lipped, to 1½ in. long, fragrant, in pairs, June–Sept.: fr. black. E. Asia; nat. in N. Amer. Var. **aureo-reticulata,** lvs. smaller, veined with yellow. Var. **chinensis** (*L. chinensis*), fls. carmine outside. Var. **Halliana** (*L. Halliana*), fls. pure white changing to yellow. Var. **repens** (var. *flexuosa, L. brachypoda*), lower, often veined with purple.

Karelini: *L. cærulea* var. *graciliflora.*

Kesselringii: *L. orientalis* var. *longifolia.*

Kirilowii: *L. cærulea* var. *viridifolia.*

Koehneana. To 12 ft.: lvs. ovate, to 4 in. long, densely pubescent beneath: fls. yellowish-white, ¾ in. long, 2-lipped, in pairs: fr. dark red. China.

Korolkowii. To 12 ft.: lvs. ovate or oval, to 1 in. long, bluish-green and pubescent beneath: fls. rose or rarely white, 2-lipped, ½ in. long, in pairs, May–June: fr. bright red. Turkestan. Var. **floribunda** has broad-ovate lvs.

Ledebourii. To 9 ft.: lvs. ovate-oblong, to 5 in. long, pubescent beneath: fls. orange tinged with scarlet, to ¾ in. long, in pairs, June–July: fr. black. Calif.

longiflora. Climbing, evergreen: lvs. oblong-lanceolate, to 2½ in. long, pale beneath: fls. white changing to yellow, to 4 in. long, fragrant: fr. white. China; not hardy N.

Maacki. To 15 ft.: lvs. ovate to ovate-lanceolate, to 3 in. long: fls. white changing to yellowish, 2-lipped, ¾ in. long, in pairs, June: fr. dark red. Asia. Var. **podocarpa** is of more spreading habit and has smaller fls. pubescent outside.

Magnevilleæ: *L. fragrantissima.*

micrantha: *L. xylosteoides.*

minutiflora. Hybrid between *L. Morrowi* and *L. xylosteoides:* lvs. oblong, to 1½ in. long: fls. whitish, 2-lipped, ½ in. long, May–June: fr. red.

Morrowi. To 8 ft.: lvs. oval to oblong, to 2 in. long, pubescent beneath: fls. white changing to yellow, 2-lipped, ½ in. long, in pairs, May–June: fr. red. Japan.

muendeniensis. Hybrid between *L. bella* and *L. Ruprechtiana,* resembling the former but lvs. darker green and more acuminate.

muscaviensis. Hybrid between *L. Morrowi* and *L. Ruprechtiana*: lvs. ovate, to 2 in. long, pubescent beneath: fls. white, 2-lipped: fr. red.

nitida. To 6 ft., evergreen: lvs. ovate, to ½ in. long, shining above: fls. creamy-white, ½ in. long, fragrant, in pairs: fr. blue-purple, transparent. China.

notha. Hybrid between *L. Ruprechtiana* and *L. tatarica:* lvs. ovate-oblong, to 2½ in. long: fls. pinkish changing to yellowish, 2-lipped, ¾ in. long, in pairs: fr. red.

oblongifolia. SWAMP FLY H. To 5 ft.: lvs. oblong, to 3 in. long, gray-pubescent beneath: fls. yellowish-white, 2-lipped, ½ in. long, in pairs, May: fr. red. N. B. to Pa. and Minn. Var. **altissima** is nearly glabrous.

odoratissima: *L. fragrantissima.*

orientalis. To 10 ft.: lvs. ovate or ovate-lanceolate, to 4 in. long, pale and pubescent beneath: fls. pink or violet, 2-lipped, ½ in. long, in pairs: fr. black. Asia Minor. Var. **caucasica** (*L. caucasica*) has elliptic lvs. glabrous beneath. Var. **longifolia** (*L. Kesselringii*) has obolng or lanceolate lvs.; fls. smaller and reddish.

parviflora: *L. dioica.*

Periclymenum. WOODBINE. Climbing: lvs. ovate or ovate-oblong, to 3 in. long, bluish-green beneath: fls. yellowish-white, 2-lipped, to 2 in. long, in whorls, June–Aug.: fr. red. Eu., N. Afr., W. Asia. Var. **aurea,** lvs. yellowish. Var. **belgica,** DUTCH W., fls. purple outside. Var. **serotina,** fls. dark purple outside, yellow inside.

pileata. Evergreen or partially so, branches often prostrate: lvs. ovate to oblong-lanceolate, to 1½ in. long, shining above: fls. whitish, ⅓ in. long, fragrant, in pairs, Apr.–May: fr. purple, translucent. China.

prolifera (*L. Sullivantii*). Climbing: lvs. oval or oblong, to 4 in. long, very glaucous, the upper connate: fls. pale yellow marked with purple, 2-lipped, 1 in. long, in whorls, June–July: fr. red. Ohio to Tenn. and Mo.

prostrata. Prostrate: lvs. ovate or oval, to ¾ in. long, pale green: fls. small: fr. bright red. China.

punicea: listed name; perhaps *L. Brownii* var. *punicea.*

pyrenaica. To 3 ft.: lvs. oblong to oblong-lanceolate, to 1½ in. long, pale beneath: fls. white, to ¾ in. long, in pairs, May: fr. red. Pyrenees.

quinquelocularis. To 15 ft.: lvs. ovate or oval, to 3 in. long, grayish and pubescent beneath: fls. yellowish, 2-lipped, ¾ in. long, in pairs, June: fr. translucent white. W. Asia.

Ruprechtiana. To 12 ft.: lvs. oblong to lanceolate, to 4 in. long, pale and pubescent beneath: fls. white changing to yellow, 2-lipped, ½ in. long, in pairs, May–June: fr. red. Manchuria.

saccata. To 6 ft.: lvs. oblong, to 2 in. long: fls. pinkish, ½ in. long, in pairs, May: fr. scarlet. China.

salicifolia. Hybrid between *L. Ruprechtiana* and *L. xylosteoides:* lvs. narrow and pointed.

sempervirens. TRUMPET H. Climbing: lvs. ovate to oblong, to 3 in. long, glaucous beneath, upper connate: fls. orange-scarlet, yellow inside, 2 in. long, in spikes, May–Aug.: fr. red. Conn. to Fla. and Tex. Var. **minor,** partially evergreen. Var. **sulphurea,** fls. yellow.—The species is evergreen in the South.

similis. Climbing, partially evergreen: lvs. lanceolate, to 4 in. long, whitish-tomentose beneath: fls. white, 2-lipped, 2 in. long, in pairs, Aug.: fr. black. China. Var. **Delavayi** differs in being glabrous except lvs. underneath.

sinensis: *L. Standishii.*

spinosa. To 4 ft., the branches somewhat spiny: lvs. linear-oblong, to 1 in. long: fls. in pairs, ¾ in. long: fr. whitish or purplish, bloomy. Himalayas. Var. **Alberti.** Lvs. glaucous: fls. rose, ½ in. long, fragrant. Turkestan.

Standishii (*L. sinensis*). To 8 ft., partially evergreen: lvs. ovate-oblong to lanceolate, to 4 in. long, hairy: fls. white, 2-lipped, ½ in. long, fragrant, in pairs, Mar.–Apr.: fr. red. China. Var. **lancifolia** has narrow-lanceolate lvs.

Sullivantii: *L. prolifera.*

syringantha. To 10 ft.: lvs. oval to oblong, to 1 in. long: fls. pinkish or lilac, ½ in. long, fragrant, in pairs, May–June: fr. red. China. Var. **Wolfii** has larger narrower lvs. and carmine fls.

tangutica. Low: lvs. obovate, to 1¼ in. long, pale beneath: fls. yellowish-white, to ½ in. long, drooping, in pairs, May–June: fr. scarlet. China.

tatarica. TATARIAN H. To 10 ft.: lvs. ovate or ovate-lanceolate, to 2½ in. long, pale beneath: fls. pink or white, 2-lipped, to 1 in. long, in pairs, May–June: fr. red. Russia to Turkestan. Cult. vars. are: **alba,** fls. pure white; **angustifolia,** lvs. narrow; **grandiflora,** fls. pure white, large; **latifolia** (var. *splendens*), lvs. to 4 in. long and 2 in. wide; **lutea,** fr. yellow; **parvifolia** (var. *gracilis*), lvs. to 2 in. long; **rosea,** fls. rose outside, pink inside.

thibetica. To 5 ft.: lvs. oblong-lanceolate, to 1¼ in. long, shining above, white-tomentose beneath: fls. pale purple, ½ in. long, pubescent outside, in pairs, May–June: fr. red. China.

tragophylla. Climbing: lvs. oblong, to 5 in. long, glaucous beneath, upper connate: fls. bright yellow, 2-lipped, to 3 in. long, in heads, June: fr. red. China.

utahensis (*Xylosteon utahense*). Low: lvs. ovate to oblong, to 2 in. long: fls. pale yellow, to ¾ in. long, in pairs: fr. red. B. C. to Ore. and Utah.

xylosteoides (*L. micrantha*). Hybrid between *L. tatarica* and *L. Xylosteum:* lvs. rhombic-ovate, bluish-green: fls. pinkish, small.

Xylosteum. EUROPEAN FLY H. To 10 ft.: lvs. ovate or obovate, to 2½ in. long, pale and pubescent beneath: fls. yellowish-white, 2-lipped, ½ in. long, pubescent outside, in pairs, May–June: fr. dark red. Eu., Asia. Var. **mollis** has lvs. pubescent on both sides.

LOOSESTRIFE: *Lysimachia, Steironema.* **Purple:** *Lythrum Salicaria.* **Swamp:** *Decodon verticillatus.*

LOPEZIA. *Onagraceæ.* Small shrubs or herbs of good habit, with alternate simple lvs. or the lower ones opposite, small attractive fls. in leafy racemes, and capsular frs.; grown under glass or in the open in mild climates. Propagated by seeds and cuttings of firm wood.

albiflora. Per. to 2 ft.: lvs. ovate to ovate-lanceolate: fls. white, often tinged with pink at the base. Mex.

coronata. Ann. to 3 ft.: lvs. ovate to lanceolate: fls. rose or lilac. Mex.

lineata. Subshrub to 3 ft.: lvs. ovate to lanceolate: fls. red. Mex.

LOPHANTHUS: *Agastache.*

LOPHOPHORA. *Cactaceæ.* Small depressed-globose or top-shaped often proliferous plant spineless except in seedlings, covered with ribs of conical tubercles that are white-hairy at apex: fls. from center of plant. One or two species. See *Cacti.*

Williamsii (*Echinocactus* and *Anhalonium Williamsii*). PEYOTE. Plant dull bluish-green, to 3 in. diam., with a thick tap-root: fls. pale pink to white, 1 in. broad when expanded. S. Tex., Mex.

LOPHOSPERMUM SCANDENS: *Maurandia Lophospermum.*

LOQUAT. An evergreen broad-leaved tree (*Eriobotrya japonica*) of China and Japan sometimes seen as an ornamental pot subject under glass but grown in California, the lower Gulf regions and Florida for its yellow oblong-pyriform to spherical acid fruits that are eaten raw or in jellies, jams, pies and preserves. The fruits attain to a length of 3 inches in large varieties. The fragrant white panicled flowers appear in autumn, followed by ripe fruits in spring. The trees attain to a height of 25 feet. In orchard formation they may be set 20 to 24 feet apart either way. The requirements are not peculiar. In northern Florida and similar regions frost may limit fruitfulness some seasons. For best results improved varieties should be grown, being budded on seedling stocks; but as commonly seen in yards the trees are unimproved seedlings.

LORANTHACEÆ. MISTLETOE FAMILY. A family comprising more than a half thousand species in about a score of genera, associated with Urticaceæ and Aristolochiaceæ series. They are green parasites with jointed sts., mostly woody and on trees, inhabitants of temp. and trop. climates in many parts of the world: lvs. mostly broad and conspicuous but sometimes reduced to scales: fls. small, in clusters or solitary, unisexual and the plants monœcious or diœcious, or bisexual: fr. a berry, which germinates on the host, and the haustoria (or roots) appropriate the juices. They are not hort. subjects. The mistletoe of literature is *Viscum album,* native from Great Britain to N. Asia, parasitic on many kinds of trees. The mistletoe of the N. American holiday markets is *Phoradendron flavescens* (first known as *Viscum flavescens*), parasitic on many deciduous trees from N. J. to Fla. and westward; there are more than 200 species of Phoradendron, all in the western hemisphere, whereas Viscum is confined to the Old World and Australia. ***Arceuthobium*** (or *Razoumofskya*) ***pusillum*** is a very small parasite on coniferous trees in E. N. Amer.; lvs. scale-like. The genus Loranthus, with many species, inhabits the warm belt mostly in the eastern hemisphere and is absent from N. Amer.

LORANTHUS: see *Loranthaceæ.*

LORDS-AND-LADIES: *Arum maculatum.*

LORINSERIA: *Woodwardia areolata.*

LOROMA: *Archontophœnix.*

LOROPETALUM. *Hamamelidaceæ.* Chinese evergreen shrubs with alternate entire lvs., white or yellowish fls. in clusters, and woody capsular frs.

Grown out-of-doors in mild climates and in a cool greenhouse in the North, although the root may withstand rather severe regions. Propagated by seeds and by grafting on Hamamelis.

chinense. To 12 ft.: lvs. ovate, to 2 in. long: fls. with strap-shaped petals to 1 in. long, Mar.–Apr.

LOTUS. *Leguminosæ.* Old World herbs or subshrubs (N. American also if Hosackia is included) with pinnate lvs., papilionaceous fls. in axillary umbels or sometimes solitary, and cylindrical pods; grown for ornament and some species for the edible pods and for forage. Propagated by seeds and the woody kinds also by cuttings, divisions, and layers.

Berthelotii (*L. peliorhynchus*). Silvery shrub to 2 ft.: lfts. 3–7, very narrow: fls. scarlet, the standard narrow and recurved. Cape Verde and Canary Isls. Var. **atrococcineus** has darker red fls. spotted with black.

corniculatus. Birds-foot Trefoil. Per. to 2 ft., often decumbent: lfts. 3, obovate, short: fls. yellow or tinged with red. Eu., Asia.—Sometimes grown for forage.

formosissimus: *Hosackia gracilis.*

glabra of hort. lists is unidentified.

glaucus. Per., sts. prostrate, glaucous-gray and pubescent: lfts. obovate, fleshy, small and crowded: pods irregularly beaded or moniliform. Madeira.

jacobæus. St. James Trefoil. Per. to 3 ft.: lfts. 3–5, linear: fls. black-purple to yellow on same plant. Cape Verde Isls.

mascaensis. Silvery shrub: lfts. very narrow: fls. bright yellow. Teneriffe.

nigricans: *Kennedia nigricans.*

ornithopodioides. Ann., usually roots with small tubercles: lfts. rhombic: fls. yellow. S. Eu.

peliorhynchus: *L. Berthelotii.*

siliquosus (*Tetragonolobus siliquosus*). To 1 ft., sts. often decumbent: lfts. obovate: fls. pale yellow: pods 4-angled. S. Eu.

tetragonolobus (*Tetragonolobus purpureus*). Winged-Pea. Trailing ann.: lfts. 3, ovate: fls. purplish-red: pods 4-angled, the seeds and young pods edible. S. Eu.

LOTUS: *Nelumbium, Nymphæa.*

LOUSEWORT: *Pedicularis.*

LOVAGE: *Levisticum officinale.*

LOVE-IN-A-MIST: *Nigella damascena.*

LOVE-LIES-BLEEDING: *Amaranthus caudatus.*

LUCERNE: *Medicago sativa.*

LUCULIA. *Rubiaceæ.* Shrubs with opposite leathery lvs., white or pink salverform 5-lobed fls. in terminal corymbs, and fr. a caps. with winged seeds; native India to Yunnan (in China). Grown in the greenhouse and planted out in summer. Propagated by cuttings of ripe wood.

gratissima. To 16 ft.: lvs. ovate-oblong, to 6 in. long: fls. pink or rose, 1½ in. across, in corymbs to 8 in. across.

intermedia. To 12 ft.: lvs. oblong or oblong-lanceolate, to 6 in. long; fls. reddish, to 2 in. long, distinguished from other species by the flap-like processes between the lobes of the corolla.

speciosa: hort. name for a larger form with deeper rose fls.

LUCUMA. *Sapotaceæ.* Trees or shrubs with alternate leathery entire lvs., small fls. and fr. a berry; differs from Achras in having 4 or 5 sepals in 1 or 2 series rather than 10 sepals in several series.

The canistel is grown in the tropics and southern Florida for the edible fruit. It is not particular as to soil. Propagated by seeds from which the husks should be removed, and probably also by budding.

mammosa: *Achras Zapota.*

nervosa (*L. Rivicoa* var. *angustifolia*). Canistel. Ti-Es. Egg-Fruit. Tree to 25 ft.: lvs. oblong-obovate, to 8 in. long: fls. greenish-white, in small clusters: fr. to 4 in. long, orange-yellow, with 2–3 shining seeds and soft orange flesh. N. S. Amer.; nat. in S. Fla. and S.

Rivicoa var. **angustifolia**: *L. nervosa.*

spinosa: *Gourliea spinosa.*

LUDOVIA: *Carludovica Laucheana.*

LUDWIGIA (or *Ludvigia*). *Onagraceæ.* Paludose or aquatic per. herbs with alternate or opposite usually entire lvs., yellow or greenish inconspicuous fls. solitary or in spikes or racemes, and capsular frs.; planted in bog-gardens or aquaria. Propagated by seeds and cuttings.

Mulerttii. Sts. rooting at nodes: lvs. opposite, oval, glossy above and crimson-purple beneath: fls. yellow, solitary in the axils. A garden plant said to have come from S. Amer.; probably *L.* (or *Isnardia*) *palustris.*

LUETKEA. *Rosaceæ.* One tufted under-shrub with trailing branches, adapted to the rock-garden. Propagated by cuttings of green wood and by division. **L. pectinata** (*Spiræa pectinata*). Herb-like: lvs. alternate, 1–2 three-parted into linear lobes: fls. white, ⅓ in. across, in terminal racemes to 2 in. long. High mts., Calif. north to Alaska.

LUFFA. *Cucurbitaceæ.* Several monœcious tendriliferous vines of trop. regions, with angled or lobed lvs., fls. large and conspicuous, yellow or whitish, pistillate solitary and staminate racemose, the corolla of 5 petals: fr. not hairy, becoming dry and more or less papery, eaten when young in some countries, grown by us mostly for ornament or for the "vegetable sponge" provided by the dry interior; called also dishcloth gourd and rag gourd. They grow easily from seeds. The two commonly cult. species are annuals from the Old World tropics.

acutangula. Lvs. angled but little if at all lobed except on young shoots: fr. club-shaped, 1 ft. or less long, strongly ridged.

cylindrica. The prevailing species cult. with us, under several names: lvs. mostly 3–7-lobed: fr. cylindric, to 2 ft. long, sometimes curved, not ridged; variable and grown under different names as *L. gigantea, L. marylandica.*

LUNARIA. Moonwort. Satin-Flower. Honesty. *Cruciferæ.* Two herbs of Eu. and Asia, one ann. or bien., one per., both cult. and also somewhat escaped: plants erect, branching: lvs. broad and simple: fls. purple to white: seed-pods or silicles moon-shaped, the septum papery and satiny after the valves drop away late in the season, and which are used in dry bouquets. Plants come readily from seed; partial shade is desirable.

annua (*L. biennis*). Honesty. Ann. or bien., 1½–3 ft. high: lvs. ovate or narrower, coarsely toothed: fls. white and purple: pods to 2 in. long and nearly as broad, obtuse or rounded at both ends. There is a variegated-lvd. form.

biennis: *L. annua.*

redidiva. Perennial H. Per. with more closely and sharply toothed lvs.: seed-pods oblong-lanceolate, tapering at both ends, much longer than broad.

LUNGAN: *Euphoria Longana.*

LUNGWORT: *Pulmonaria.*

LUPINE: *Lupinus.*

LUPINUS. Lupine. *Leguminosæ.* Herbs or sometimes shrubs with digitately compound lvs., showy papilionaceous fls. in terminal spikes or racemes, and flattened pods often constricted between the seeds; a few species grown for cover-crops, forage and human food but in Amer. mostly known as ornamental subjects in the flower-garden.

Lupines may be grown on any well-drained soil, thriving even on poor sandy lands. Propagated by seeds sown where the plants are to stand or the perennial kinds also by division.

affinis. Ann. to 2 ft., nearly glabrous: fls. deep bluish-purple, in spring: pods 1 in. long, the seeds small. Calif.

albifrons. Woody per. to 5 ft., often with hard trunk: lfts. 7–10, spatulate to obovate, silvery-silky, to 1 in. long: fls. about ½ in. long, blue or purplish with white or yellow center: pods yellowish, to 2 in. Calif.

albococcineus: *L. pubescens.*

albus. White L. Ann. to 4 ft., hairy: fls. white or slightly tinted: pods to 4 in. long, the seeds large. Levant.—An agricultural species.

angustifolius. Ann. to 1 ft. or more, hairy: fls. dark blue, in early summer: pods ½ in. wide. Medit. region.

arboreus. Tree L. Shrub to 8 ft., slightly pubescent: fls. sulfur-yellow, in summer: pods to 3 in. long, the seeds small. Calif. Var. Snow Queen has pure white fls. and also **albus.**

argenteus (*L. decumbens*). Per. to 3 ft., silvery-pubescent: fls. violet, rose or white, in summer: pods ¾ in. long. W. N. Amer.

atrococcineus: *L. pubescens.*

californicus: *L. pubescens.*

Chamissonis. Shrubby, to 3 ft., silky-tomentose: fls. blue or lavender with yellow spot on standard, in spring and at other seasons. Calif.

concinnus. Ann. to 6 in., densely hairy: fls. violet with yellow spot on standard. S. Calif.

Cruckshanksii: *L. mutabilis* var.

cytisoides. Broom L. Per. to 6 ft., minutely hairy: fls. rose-purple, Apr.–Aug. S. Calif.

decumbens: *L. argenteus.*

densiflorus (*L. Menziesii. L. sulphureus*). Ann. to 2 ft., hairy: fls. white, yellow or rose, in spring. Calif.

Dunnettii: *L. pubescens.*

duplex: *L. pubescens.*

elegans: *L. pubescens.*

guatemalensis: *L. pubescens.*

Hartwegii. Ann. to 3 ft., with shaggy hairs: fls. blue with standard partially rose-colored, July–Sept.: pods about 1 in. long, the seeds small. Mex. Vars. **albus, cœlestinus, roseus** and **ruber** are color forms.

hirsutissimus. Ann. to 1 ft., very hairy with stinging hairs: fls. reddish-purple, in spring: pods to 1½ in. long. S. Calif.

hirsutus. Blue L. Ann. to 2 ft., brown-hairy: fls. blue, the keel usually tipped with white, July–Aug.: pods large with large seeds. S. Eu. Vars. **albus, cæruleus, carneus** and **ruber** are color forms.

hybridus: *L. pubescens* and *L. mutabilis.*

insignis: *L. pubescens.*

longifolius. Shrubby, to 5 ft., grayish-pubescent: fls. deep blue to nearly white with a whitish or rose-purple spot on standard, in winter and spring: pods to 1½ in. long. S. Calif.

luteus. Yellow L. Ann. to 2 ft., hairy: fls. yellow, fragrant, June–July: pods to 4 in. long, with large seeds. S. Eu.

Menziesii: *L. densiflorus.*

micranthus. Ann. to 1½ ft., hairy: fls. blue and white, very small: pods about 1 in. long. B.C. to Calif.

Moerheimii: *L. polyphyllus* var.

Moritzianus: *L. pubescens.*

mutabilis. Ann. to 6 ft., glabrous: fls. white with yellow or violet on standard, June–Aug.: pods to 3 in. long, the seeds large. Mts. of S. Amer. Var. **Cruckshanksii** (*L. Cruckshanksii*) has bluish fls. shaded with violet and purple. Peru. Vars. **roseus** and **versicolor** are color forms. *L. pantelericus* and *L. hybridus nigrescens* are probably forms of *L. mutabilis.*

nanus. Ann. to 15 in., pubescent: fls. blue with white purple-dotted spot on standard, fragrant, May–July: pods ¾ in. long, the seeds small. Calif. Vars. **albus, albo-roseus** and **albo-violaceus** are color variations.

nootkatensis. Per. to 3 ft., hairy: fls. blue variegated with red and yellow, May–July: pods 1½ in. long. Near sea, Wash. to Aleutian Isls.

pantelericus: *L. mutabilis.*

Paynei. Shrub to 8 ft., with silvery foliage: fls. blue, lavender, pink or white with yellow blotch on standard, fragrant, in spring. Calif.

perennis. Sun-Dial L. Per. to 2 ft., pubescent: fls. blue varying to pink and white, May–June: pods 1½ in. long. Me. to Fla.

pilosus. Ann. to 4 ft., hairy: fls. rose with red spot on standard. Levant.

plattensis. Per. to 2 ft., hairy: fls. pale blue with dark spot on standard, June–July: pods to 1¼ in. long. Wyo. to Kans.

polyphyllus. Per. to 5 ft., glabrous except the woolly pods: fls. purplish with blue wings, June–Sept.: pods 1½ in. long, the seeds small. Wash. to Calif. Var. **Moerheimii** is more compact and has various colored fls. Var. **albus** and **albiflorus** have white fls. and **bicolor** blue and white fls. **L. roseus** represents a rose-colored race.

pubescens. Ann. to 3 ft., pubescent: fls. violet-blue with white center: pods 1 in. long, the seeds small. Mex. and Guatemala.—Here belongs the group known as **L. hybridus**, comprising such names as *albococcineus, atrococcineus, californicus, Dunnettii, duplex, elegans, guatemalensis, hybridus roseus, insignis, Moritzianus, pulcherrimus, speciosus, succulentus, superbus, tricolor, venustus.*

pulcherrimus: *L. pubescens.*

rivularis. Per. to 3 ft., hairy: fls. blue or variegated, marked with yellow: pods to 2 in. long. Wash. to Calif.

roseus: *L. polyphyllus* and *L. pubescens.*

speciosus: *L. pubescens.*

subcarnosus (*L. texensis*). Ann. to 1 ft., silky-pubescent: fls. blue with white or yellow spot on standard, in spring: pods 1½ in. long, the seeds small. Tex.

succulentus: *L. pubescens.*

sulphureus: *L. densiflorus.*

superbus: *L. pubescens.*

Termis. Egyptian L. Ann. to 5 ft., silky-hairy: fls. white tinted with blue: seeds large. Levant.—An agricultural species.

texensis: *L. subcarnosus.*

tricolor: *L. pubescens.*

truncatus. Ann. to 2 ft., slightly hairy: fls. violet: pods 1 in. long. S. Calif.

varius. Ann. to 3 ft.: fls. red and blue. S. Eu.

venustus: *L. pubescens.*

LUVUNGA: *Lavanga.*

LYCASTE. *Orchidaceæ.* Trop. American epiphytic and terrestrial orchids with pseudobulbs bearing 1 to several plaited lvs. and solitary fls., the lateral sepals united with column to form a spur-like body, the lip 3-lobed; cult. as under *Orchids.* Grown in intermediate temperature and shade.

aromatica. Pseudobulbs to 2 in. high, with 1–2 lvs. to 10 in. long: fls. very fragrant, 2½ in. across, orange-yellow, the lip spotted with rose and with a broad crest, Apr.–May. Mex.

candida. Fls. about 2 in. across; sepals greenish dotted with red; petals and lip white spotted with red, with small crest, Dec. Guatemala.

cruenta. Fls. orange-yellow, the lip crimson at base, Mar.–May. Guatemala.

Deppei. Pseudobulbs with 3–4 lvs.: fls. about 4 in. across; sepals greenish spotted with red; petals white; lip whitish spotted with red, the middle lobe yellow spotted red, Feb.–Apr., Oct.–Nov. Mex.

fulvescens. Pseudobulbs to 4 in. high, with 2 lvs. to 20 in. long: fls. yellowish tinged with brown, the lip fringed, May–June. Colombia.

Harrisoniæ: *Bifrenaria Harrisoniæ.*

lanipes. Pseudobulbs 2 in. high, with 2 lvs. to 16 in. long: fls. greenish-white, Apr.–June. Brazil to Peru.

lasioglossa. Lvs. to 1 ft. long: fls. with brown sepals, yellow petals and yellow lip with hairy red-spotted midlobe, Apr.–May. Mex., Guatemala.

Skinneri. Pseudobulbs to 3 in. high, with 2–3 lvs. to 2 ft. long: fls. to 6 in. across, with white or rose sepals, rose petals, dark purple lip with yellow or white midlobe spotted with red, Oct.–Dec. Mex. Var. **alba** has white fls. with yellow on lip.

LYCHEE: *Litchi chinensis.*

LYCHNIS. *Caryophyllaceæ.* Erect herbaceous annuals and perennials, many of which are good garden subjects: fls. solitary or in clusters, often very showy, white, pink, purple, shades of red, the petals usually 2-notched: lvs. commonly opposite and entire: native in the north temp. and arctic zones. All are easily grown from seed, the perennials being propagated also by division.

alba (*L. vespertina*). Evening Campion. Bien. or per. to 2 ft., sticky-hairy: lvs. ovate-lanceolate to oblong: fls. white and fragrant, to 1 in. across, opening in the evening, in loose few-fld. panicles. Eu.; adventive in E. U. S.

alpina (*Viscaria alpina*). Arctic Campion. Per., smooth, tufted, 1 ft. or less: lvs. linear-lanceolate: fls. pink, ⅓ in. across, in dense terminal heads, Apr. Arctic and alpine regions in Eu., Asia, N. Amer. Color vars. are **alba** and **rubra.**

Arkwrightii. Hybrid between *L. Haageana* and *L. chalcedonica*, with fls. in shades of scarlet.

chalcedonica. Maltese Cross. Jerusalem Cross. Scarlet Lightning. Per., 2–3 ft., usually loosely hairy: lvs. ovate to lanceolate, mostly clasping: fls. scarlet, about 1 in. across, in dense terminal heads, June–July. Russia and Siberia; escaped in E. U. S. There are vars. with white or flesh-colored fls. as **alba** and **salmonea,** and sometimes double forms.

Cœli-rosa (*Agrostemma Cœli-rosa*). Rose-of-Heaven. Ann. to 1½ ft.: lvs. linear: fls. nearly 1 in. across, rose-red, solitary, terminal. Medit. region. Var. **alba,** fls. white. Var. **fimbriata,** petals toothed. Var. **kermesina,** fls. red. Var. **oculata,** fls. purple-eyed.

Coronaria (*Agrostemma Coronaria. Coronaria tomentosa*). Mullein-Pink. Dusty Miller. Rose Campion. Bien. or per. to 3 ft., densely white-woolly: lvs. oval or oblong: fls. crimson, 1 in. or more across, terminal and solitary, June–July. S. Eu.; escaped in N. Amer. There are white and double-fld. forms.

coronata (*L. grandiflora*). Bien. or per. to 1½ ft.: lvs. oval-elliptic: fls. brick-red, salmon or cinnabar, 2 in. or more across, in open panicles. China, Japan. Var. **Sieboldii,** large pure white fls.

corsica. Ann. to 3 ft.: fls. pink changing to reddish, in panicles. Corsica.

dioica (*L. diurna*). Red or Morning Campion. To 2 ft., coarse, hairy and usually somewhat sticky: lvs. oblong to ovate: fls. normally red, to 1 in. across, in loose clusters, opening in the morning. Eu. and Asia; escaped in E. U. S. There are white and double-fld. vars.

diurna: *L. dioica.*

fimbriata: *L. Cœli-rosa* var.

Flos-cuculi (*Agrostemma Flos-cuculi. Coronaria Flos-cuculi*). Cuckoo-Flower. Ragged Robin. Per., slender, floriferous, soft-hairy below, sticky above: lvs. narrow-lanceolate: fls. red or pink, to 1 in. across, in loose panicles, May–Aug. Eu., N. Asia; nat. in E. U. S. There are double-fld. and white vars.

Flos-Jovis (*Agrostemma* and *Coronaria Flos-Jovis*). Flower-of-Jove. Per. to 1½ ft., white-tomentose: lvs. oval-lanceolate: fls. pink, to ½ in. across, in dense umbel-like clusters, June–July. Mts. of S. Eu.

fulgens. Per. to 2 ft., hairy: lvs. ovate to ovate-oblong: fls. bright scarlet, to 2 in. across, in few-fld. dense terminal clusters. Siberia.

Githago: *Agrostemma Githago.*

grandiflora: *L. coronata.*

Haageana. Hybrid between *L. fulgens* and *L. coronata* var. *Sieboldii:* per., somewhat hairy, to 1 ft., intermediate in characters between the parents: fls. orange-red, scarlet or crimson, about 2 in. across, in 2's or 3's, May–June.

Lagascæ: *Petrocoptis Lagascæ.*

oculata: *L. Cœli-rosa* var.

pyrenaica. To 4 in. or more, with open branching: lvs. spatulate, to 1½ in. long, glaucous, those on st. cordate: fls. flesh-color, small, on long pedicels. Pyrenees.

Sartori. To 1 ft.: lvs. lanceolate: fls. purple, ½ in. across. China? Botanical position uncertain.

Sieboldii: *L. coronata* var.

Vaccaria: *Saponaria Vaccaria.*

vespertina: *L. alba.*

Viscaria (*Viscaria viscosa*). German Catchfly. Per. to 1½ ft., smooth with sticky patches beneath the fl.-clusters: lvs. long and narrow: fls. red or purple, about ½ in. across, in loose panicles, May–June. Eu., N. Asia. Vars. are **alba, grandiflora alba, rosea, splendens, splendens flore-pleno.**

Walkeri. Hybrid between *L. Coronaria* and *L. Flos-Jovis:* silvery-hairy, with carmine-red fls. from June to Oct.

LYCIUM. Box-Thorn. Matrimony-Vine. *Solanaceæ.* Deciduous and evergreen shrubs, often clambering and requiring support, with alternate or clustered small lvs., usually grayish-green: fls. funnel-shaped, greenish, whitish, purplish or violet, solitary or clustered, the stamens commonly exserted: berries usually scarlet.

Lyciums grow in all usual soils. As suckers are generally produced, the plants should not be set near flower-beds. They may be propagated by hardwood cuttings, by suckers, by layers, and by seed.

barbarum. Often confused with *L. halimifolium* but differing in the smaller narrow lvs. and the glabrous filaments. N. Afr.

carolinianum. To 5 ft., spiny: lvs. spatulate, thick and fleshy, to 1 in. long: fls. ¼ in. long, limb as long as tube, the filaments woolly at base: fr. red, ½ in. across. S. C. to Fla. and Tex.

chinense. Shrub with arching and often prostrate branches to 12 ft. long, usually unarmed, branchlets yellowish-gray: lvs. ovate or ovate-lanceolate, to 3 in. long, remaining green until late in autumn: fls. purple, ½ in. long, the limb longer than corolla-tube, filaments pubescent at base: fr. scarlet to orange-red, to 1 in. long. E. Asia. Var. **ovatum** has lvs. to 4 in. long.—Very like *L. halimifolium* and perhaps not distinct as commonly defined; the fl. characters of separation are not constant; in *L. chinense* the lvs. on flowering branchlets are prominently broad and short while those of *L. halimifolium* are long and very narrow.

europæum. Differs from *L. halimifolium* in the smaller narrower lvs., more slender corolla-tube, and glabrous filaments. Medit. region.

halimifolium (*L. vulgare*). Upright or spreading shrub to 10 ft., arching or recurving branches, usually spiny; branchlets light gray: lvs. commonly lanceolate, to 2½ in. long, thickish: fls. dull lilac-purple, the limb shorter than tube, filaments pubescent at base: fr. to ¾ in. long, scarlet to orange-red. S. E. Eu., W. Asia.

horridum. To 3 ft., much branched, spiny: lvs. spatulate, ¼ in. long: fls. whitish, ¼ in. long, the filaments pubescent at base. S. Afr., where it is planted for hedges.

pallidum. To 6 ft., much branched, spiny: lvs. lanceolate, to 2 in. long, glaucous and fleshy: fls. nodding, greenish-yellow tinged purple, ¾ in. long, tube three times longer than lobes, filaments glabrous: fr. scarlet, ½ in. across. Utah to Mex.

ruthenicum. Spiny: lvs. linear to linear-lanceolate, to 1¼ in. long: fls. ½ in. long, lobes much shorter than tube, filaments pubescent at base: fr. black. E. Eu., W. Asia.

vulgare: *L. halimifolium.*

LYCOPERSICON. TOMATO. *Solanaceæ.* Herbaceous annuals and perennials, the lvs. pinnately compound, fls. yellow, fr. a pulpy berry, 2- or few-celled, the cells multiplied under cult.; native in S. Amer. but spontaneous in small-fruited forms in many warm regions. Sometimes united with Solanum, from which it differs in technical characters. See *Tomato.*

esculentum. Tender per. but treated as an ann., to 6 ft. and more, more or less hairy, with strong odor: lvs. to 1½ ft. long, of 5–9 more or less curled toothed lfts. to 3 in. long: fls. nodding, ¾ in. across: fr. red or yellow, to 3 in. across, usually flattened at the ends, sides grooved or furrowed. W. S. Amer. Var. **cerasiforme.** CHERRY T. Lvs. thinner and smaller: fls. in longer clusters: fr. globular and regular, about ¾ in. diam., red or yellow; forms with oblong fr. are PLUM T. Var. **commune** (var. *vulgare*). COMMON T. Lfts. little if at all curled: plants heavier and more lopping: fr. mostly globular or only flattened a little, the sides not furrowed or grooved, many-celled. Var. **grandifolium.** LARGE-LEAVED or POTATO-LEAVED T. Lvs. large and plane, lfts. fewer. Var. **pyriforme.** PEAR T. Fr. pear-shaped, about 1½ in. long. Var. **validum.** UPRIGHT T. Stout, erect, very compact: lvs. crowded and curled.

pimpinellifolium (*L. racemiforme. L. racemigerum*). CURRANT T. Weak, sts. slender, finely pubescent, without pronounced odor: lvs. of 5–7 lfts. to 1½ in. long: fls. 10–25 in an elongated raceme: fr. red, currant-like, about ½ in. diam., 2-celled. Peru.

racemiforme: *L. pimpinellifolium.*

racemigerum: *L. pimpinellifolium.*

LYCOPODIACEÆ. CLUB-MOSS FAMILY. Four genera of moss-like evergreen herbs with numerous small lvs. and minute spores borne either in terminal spikes or in lf.-axils, often picked for decorations, particularly in the holiday season. They are pteridophytes or "flowerless" plants, belonging with the fern allies. Only Lycopodium is known to hort.

LYCOPODIUM. CLUB-MOSS. *Lycopodiaceæ.* Evergreen herbs with needle- or scale-like lvs., widely scattered over the world, the native ones often used for Christmas greens. Grown in moist shady places. Propagated by cuttings.

Billardieri. Usually growing on trees or rocks, sts. to 5 ft. long, much branched: spikes numerous, terminal, to 4 in. long. New Zeal.

clavatum. RUNNING-PINE. Sts. creeping to 9 ft., with very leafy ascending branches: spikes 1–4, on sts. to 4 in. long. N. Amer., Eu., Asia.

complanatum. GROUND-CEDAR. Sts. trailing, the ascending branches often fan-like (var. *flabelliforme*) and lvs. 4-ranked: spikes 1–4, on sts. to 5 in. long. N. Amer., Eu., Asia.

dendroideum: *L. obscurum.*

lucidulum. SHINING C. Sts. to 10 in. high, decumbent at base: lvs. glossy green: sporangia in axils of lvs. N. Amer.

obscurum (*L. dendroideum*). GROUND-PINE. Main st. creeping underground, branches to 10 in. high, tree-like: spikes nearly sessile. N. Amer., Asia.

LYCOPUS. WATER HOARHOUND. *Labiatæ.* Small per. mint-like herbs making stolons at base, in north temp. zone, with small white, tinted or purplish fls. in close axillary clusters, adapted to moist places and wild-gardens: lvs. opposite, sessile or short-stalked, variously dentate, mostly narrow.

americanus (*L. sinuatus*). To 2 ft., erect: lvs. lanceolate or somewhat broader, short-petioled, dentate to incised, to 4 in. long: corolla little exceeding calyx, pale with crimson spots. Moist ground, Newf. to Fla. and Calif.

sinuatus: *L. americanus.*

LYCORIS. *Amaryllidaceæ.* Chinese and Japanese bulbous herbs with narrow basal lvs. disappearing before the fls. which are yellow or red and borne in an umbel at tip of solid scape, the perianth-segms. united into a short tube. Hardy out-of-doors with winter protection, and also grown under glass.

aurea (*Amaryllis aurea*). Lvs. to ¾ in. across: fls. yellow, 3 in. long, in summer. China.

radiata (*Amaryllis radiata*). Lvs. linear: fls. bright red or white in var. **alba,** 1½ in. long, in autumn. China, Japan.

sanguinea. Lvs. linear: fls. bright red, 2 in. long, in summer. Japan.

squamigera (*Amaryllis Hallii*). Lvs. to 1 in. across: fls. rose-lilac or pink, 3 in. long, in summer, fragrant. Japan. Var. **purpurea** is listed.

LYGISTUM: *Manettia.*

LYGODIUM. CLIMBING-FERN. *Schizæaceæ.* Twining vine-like ferns with palmately or pinnately lobed or divided lvs. or secondary pinnæ; sori borne on contracted divisions of lf., often forming panicles; mostly native in tropics. The twining st. is really petiole and rachis.

circinatum (*L. dichotomum*). Lvs. deeply palmately divided into entire segms. to 1 ft. long, bright green. Trop. Asia, Malaya.

dichotomum: *L. circinatum.*

japonicum. Lvs. pinnate into pinnatifid or lobed segms., margins toothed, pale green. E. Indies, E. Asia, Australia.

palmatum. HARTFORD-FERN. Lvs. nearly orbicular, palmately 4–7-lobed, margins entire, fertile lvs. forming terminal panicle. Mass. to Fla. and Tenn.

scandens. Lvs. pinnate into ovate or ovate-lanceolate segms. to 2 in. long, sometimes lobed, bluish-green. E. Asia.

volubile. Lvs. pinnate into lanceolate segms. to 1 ft. long. Trop. Amer.

LYONIA (*Xolisma*). *Ericaceæ.* Evergreen and deciduous shrubs with alternate lvs., white or pinkish fls. in clusters or panicles, and capsular frs.; cult. as for Leucothoë. Adapted for colonizing and in shrubby collections; mostly plants of moist soil. Asian species may be expected to appear in general cult.

ligustrina (*Andromeda ligustrina. Arsenococcus ligustrinus*). Male-Berry. He-Huckleberry. To 12 ft., deciduous: lvs. to 3 in. long, entire or finely toothed: fls. in panicles to 6 in. long, May–July. Me. to Fla. and Tex.

lucida (*L. nitida. Pieris lucida* and *nitida. Neopieris nitida. Desmothamnus lucidus*). Fetter-Bush. To 6 ft., evergreen: lvs. to 3 in. long, entire, shining above: fls. in terminal leafy racemes, Mar.–May. Va. to Fla. and La., in low woods and barrens.

mariana (*Andromeda, Neopieris* and *Pieris mariana*). Stagger-Bush. To 6 ft., deciduous: lvs. to 2½ in. long, entire: fls. nodding, in terminal leafless racemes, May–June. R. I. to Fla. and Ark.

nitida: *L. lucida.*

LYON-SHRUB: *Lyonothamnus.*

LYONOTHAMNUS. Lyon-Shrub. *Rosaceæ.* One evergreen tree confined to the isls. off coast of S. Calif. and planted in warm regions. **L. floribundus.** Catalina Ironwood. To 55 ft.: lvs. lanceolate, to 8 in. long, nearly entire or pinnately cut or sometimes pinnately compound, dark green and shining above: fls. small, white, in corymbs to 8 in. across. In var. **asplenifolius** the lvs. are pinnately divided into lobed lfts.—Propagated by basal sprouts, with difficulty by cuttings or by seeds when produced.

LYRATE: pinnatifid, but with an enlarged terminal lobe and smaller lower and sometimes intermediate lobes.

LYSIAS: *Habenaria Hookeri.*

LYSICHITUM. *Araceæ.* One stemless ill-scented herb native in swamps of W. N. Amer. and E. Asia. **L. camtschatensis.** Yellow Skunk-Cabbage. Lvs. from thick rootstocks, to 5 ft. long, oblong-lanceolate: fls. greenish-yellow, borne on a spadix; spathe yellowish, the blade to 4 in. long.

LYSIMACHIA. Loosestrife. *Primulaceæ.* Mostly per. summer-blooming herbs, with yellow or white, rarely purple or blue, fls. borne singly or in spikes or racemes, sometimes whorled, wheel- or bell-shaped corolla, and fr. opening by 5 valves; of temp. and subtrop. distribution, a few grown for ornament in moist situations. Propagated by division.

barystachys (*L. brachystachys*). To 2½ ft.: lvs. linear to lanceolate, glaucous beneath: fls. white, in dense racemes at first nodding. E. Asia.

brachystachys: *L. barystachys.*

ciliata: *Steironema ciliatum.*

clethroides. To 3 ft., pubescent: lvs. ovate-lanceolate: fls. white, in slender terminal spikes. China, Japan.

dubia. To 2 ft.: lvs. linear-lanceolate: fls. rose, in spikes. S. E. Eu., W. Asia.

Ephemerum. To 3½ ft.: lvs. linear-lanceolate, glaucous: fls. white, in racemes. Medit. region.

Fortunei. To 2 ft., glabrous: lvs. oblong-lanceolate: fls. white, in many-fld. racemes. China, Japan.

japonica. Decumbent or ascending to 5 in.: lvs. ovate, punctate: fls. yellow, solitary in the axils. E. Asia to Sumatra.

Nummularia. Moneywort. Creeping Jennie or Charlie. Creeping: lvs. round: fls. yellow, solitary in the axils. Eu.; nat. in E. N. Amer.

punctata (*L. verticillata*). To 3 ft.: lvs. in 3's or 4's, ovate-lanceolate: fls. yellow, in axillary whorls. Eu., nat. in E. U. S.

quadrifolia. To 3 ft.: lvs. usually in 4's or 5's, lanceolate to ovate: fls. yellow with dark streaks, axillary, long-stalked. N. B. to Ga. and Tenn.

terrestris. Glabrous, erect, to 2 ft.: lvs. mostly opposite, lanceolate, acute, to 3 in. long, with minute black dots: fls. yellow, in terminal racemes. Moist ground, Newf. to Ga. and west.

thyrsiflora. To 2 ft.: lvs. lanceolate: fls. yellow, in short axillary heads. Swamps, Eu., Asia, N. Amer.

verticillata: *L. punctata.*

vulgaris. Bushy, 3–5 ft.: lvs. whorled or opposite, ovate-lanceolate: fls. yellow, in leafy panicles. Eu., Asia; nat. in E. U. S.

LYTHRACEÆ. Loosestrife Family. About 21 widely distributed genera of herbs, shrubs or trees, many of them in trop. Amer., with mostly alternate or whorled lvs., bisexual polypetalous fls. having tubular calyx, 4–6 petals or sometimes without petals, few to many stamens, superior 2–6-celled ovary, and capsular fr. Several genera furnish medicinal and dye products, others timber, and the following are grown with us for ornament: Cuphea, Decodon, Heimia, Lagerstrœmia, Lawsonia, Lythrum.

LYTHRUM. *Lythraceæ.* Herbs with mostly opposite entire lvs. and 4-angled branches, purple to white fls. solitary or in racemes or spikes, and capsular frs.; planted in borders and wild-gardens. Of easy cult. in moist soil. Propagated by division and by seeds when available.

alatum. Per., erect, to 4 ft., st. angled or winged: lvs. opposite or alternate, sessile, oblong to lanceolate, to 1¼ in. long: fls. small, purple, solitary in axils. New England to Ark.

flexuosum (*L. Graefferi*). Sts. to 2½ ft. long, prostrate or ascending: lvs. to 1¼ in. long and ⅓ in. wide: fls. purple, usually solitary. Eu., N. Afr., Asia Minor.

Graefferi: *L. flexuosum.*

hyssopifolia. Ann. to 2 ft.: lvs. to ¾ in. long and ¼ in. wide: fls. pink-purple, very small, solitary. Temp. regions of world.

roseum superbum: *L. Salicaria* var.

Salicaria. Purple Loosestrife. Per. to 3 ft. with a hard and woody root: lvs. lanceolate, to 4 in. long, broad at base: fls. purple, to ¾ in. across, in dense leafy terminal spikes. Old World; nat. in N. Amer. Var. **roseum superbum** has larger rose-colored fls. and in var. **tomentosum** the whole plant is white-tomentose.

virgatum. Closely resembling *L. Salicaria* but with lvs. narrow at base and smaller fls. in leafy open racemes. Eu., Asia; somewhat nat. in Mass.

M

MAACKIA. *Leguminosæ.* Deciduous trees with pinnate lvs., white papilionaceous fls. in dense upright racemes, and flattened pods; native in E. Asia. Cult. as for *Cladrastis* from which the genus differs in technical characters.

amurensis (*Cladrastis amurensis*). To 40 ft.: lvs. of 7–11 ovate lfts.: fls. ⅓ in. long, July–Aug.: pods to 2 in. long. Manchuria.

chinensis (*M. hupehensis*). To 50 ft.: lvs. of 11–13 ovate lfts.: fls. ⅓ in. long. China.

hupehensis: *M. chinensis.*

MABA. *Ebenaceæ.* Hardwooded trees and shrubs differing from Diospyros in technical floral characters, native in warm and trop. regions, two of them having been intro. into southern parts of U. S. for ornament; mostly diœcious.

natalensis (*Ebenus natalensis*). Evergreen shrub to 20 ft.: lvs. small, ovate, oblong or elliptic, obtuse or mucronate, glabrous: berries black, in bunches, chestnut-color, about ⅓ in. long. S. Afr.

sandwicensis (*Ebenus sandwicensis*). Lama. Tree to 40 ft.: lvs. thick, elliptic to ovate-oblong, to 2 in. long, glabrous or becoming so: berries reddish-yellow when mature, about ⅓ in. long, edible. Hawaii, Fiji.

MACADAMIA. *Proteaceæ.* Australian trees or shrubs with whorled lvs., small bisexual fls. borne in pairs in simple racemes, and fr. a hard globose drupe; one species grown in S. Calif. and S. Fla. for the edible nuts.

The Queensland nut withstands slight frosts; it succeeds in fertile loamy moist soils. Propagated by seeds planted singly in pots or stratified in sand; germination under glass is slow unless artificial heat is employed.

ternifolia. Queensland Nut. To 50 ft.: lvs. in whorls of 3–4, oblong or lanceolate, to 1 ft. long, toothed, shining: fls. white, in racemes to 1 ft. long: nuts 1 in. across, smooth and shining, globular or hemispherical. Queensland, New S. Wales.

MACFADYENA: *Dolichandra cynanchoides.*

MACHÆRANTHERA: *Aster Bigelovii* and *Pattersonii.*

MACHÆRIUM: *Tipuana Tipu.*

MACHÆROCEREUS. *Cactaceæ.* Two prostrate or low and bushy cacti of Lower Calif. (Mex.), often with long horizontal branches, very spiny, ribs low, the central spines dagger-like: fls. diurnal, long and slender, the perianth persisting on the fr. See *Cacti.*

eruca (*Cereus* and *Lemaireocereus eruca*). Prostrate, tips ascending: fls. 4 in. or more long, yellow.—A creeping plant, dying back at basal end, and therefore should not be grown in a pot but on a bed or large flat box.

gummosus (*Cereus* and *Lemaireocereus gummosus*). Bushy and erect, 3 ft. or less: fls. to 5 in. long, purple.

MACKAYA. *Acanthaceæ.* Shrubs native in India and Afr., with opposite simple lvs. and tubular fls. much dilated above; one species grown in the open in S. U. S. and under glass. Propagated by cuttings in spring or summer.

bella (*Asystasia bella*). To 4 ft., erect: lvs. oblong, to 5 in. long, toothed: fls. lavender, to 2½ in. long, in terminal racemes to 6 in. long. S. Afr.

MACLEAYA. *Papaveraceæ.* Glaucous per. herbs, sometimes shrubby, with pinnately lobed lvs. and many small cream-colored fls. without petals borne in terminal panicles, known in cult. as Bocconia; grown in borders and as specimen plants for the bold attractive habit and appearance. Propagated by suckers.

cordata (*Bocconia cordata* and *japonica*). Plume-Poppy. Tree Celandine. To 8 ft.: lvs. to 8 in. across, white beneath: panicles to 1 ft. long. China, Japan.—Common in cult.

microcarpa (*Bocconia microcarpa*). Differs from *M. cordata* in the lvs. pubescent beneath, 8–12 instead of 24–30 stamens, and 1-seeded rather than 4–6-seeded caps. Cent. Asia.

MACLURA (*Toxylon*). *Moraceæ.* One deciduous spiny tree native from Ark. to Tex., **M. pomifera** (*M. aurantiaca*). Osage-Orange. To 60 ft.: lvs. ovate to oblong-lanceolate, to 5 in. long, entire, slender-stalked: staminate fls. in short racemes, pistillate in small dense heads: fr. a rough heavy syncarp, orange, to 5 in. across.—A popular hedge plant and succeeds on land not very rich. Hardy as far north as Cent. N. Y. and New England. Propagated easily by seeds, also by cuttings of young wood and root-cuttings under glass.

MACRADENIA. *Orchidaceæ.* Trop. American epiphytes with 1-lvd. pseudobulbs and fls. in pendulous racemes, the sepals and petals similar, the lip 3-lobed, the side lobes united with the column; grown in the warm greenhouse. See *Orchids.*

modesta (*Serrastylis modesta*). Lvs. to 7 in. long: fls. in many-fld. racemes to 5 in. long; sepals and petals red-brown edged with yellow; lip yellowish-white, Feb.–Mar. Colombia.

MACROPIPER. *Piperaceæ.* Woody plants native in New Zeal. and the S. Seas, having alternate entire lvs. and very small fls. without perianth, in dense axillary unisexual spikes; sometimes grown in the greenhouse for ornament. Propagated by cuttings.

excelsum. To 20 ft., aromatic: lvs. broad-ovate, to 5 in. long, yellow-green, palmately nerved from base: spikes to 3 in. long.

MACROPLECTRUM: *Angræcum sesquipedale.*

MACROZAMIA. *Cycadaceæ.* About 14 Australian species often with underground trunks, having pinnate lvs. without distinct midvein in the pinnæ and striate underneath, and fls. borne in cones. They differ in technical non-horticultural characters from *Cycas*, which see; more closely related to Dion and Encephalartos.

flexuosa. Trunk mostly underground: lvs. erect, flexuous, the rachis spirally twisted; lfts. very narrow, about ¼ in. broad to 8 in. long, entire. New S. Wales.

spiralis. Trunk mostly subterranean but sometimes to 6 ft. and 2 ft. diam.: lvs. to 4 ft. long; lfts. to 10 in. long, flat, somewhat decurrent on lower margin, sharp-pointed, parallel-veined underneath. New S. Wales.

MADDENIA. *Rosaceæ.* Asian deciduous trees or shrubs with alternate toothed lvs., diœcious fls. without petals borne in racemes, and fr. a drupe; infrequently planted and hardy N.

hypoleuca. MADDEN-CHERRY. To 20 ft.: lvs. oblong, to 3 in. long: racemes to 2 in. long, Apr.–May. China.

MADDER: *Rubia tinctorum.*

MADEIRA-VINE: *Boussingaultia baselloides.*

MADIA. TARWEED. *Compositæ.* Glandular and sticky usually heavy-scented ann. and per. herbs: lvs. mostly alternate: heads axillary or terminal, of yellow ray- and disk-fls. closing in the sunshine; pappus none; native W. N. Amer. to Chile.

corymbosa: *M. elegans.*

dissitiflora. Ann. to 2 ft.: lvs. linear, to 2½ in. long: heads sulfur-yellow, rays to ⅙ in. long. Calif.

diversifolia: listed name.

elegans (*M. corymbosa*). COMMON T. Ann. to 2 ft.: lvs. linear, to 5 in. long: heads long-stalked, rays yellow throughout or with a brown spot at base, to ¾ in. long. Calif. and Ore. to Nev.

sativa. CHILE T. Ann. to 4 ft.: lvs. lanceolate to linear, to 2 in. long: heads sessile or short-stalked, rays honey-yellow, ⅙ in. long. Chile; a coarse plant, nat. in Ore., Calif.

MADRE: *Gliricidia sepium.*

MADRONA: *Arbutus Menziesii.*

MADWORT: *Alyssum.*

MÆSA. *Myrsinaceæ.* Trees or shrubs native in the tropics of the Old World, bearing alternate lvs., small white fls. in racemes, and berry-like fr.; one species is grown under glass, and in the open in warm countries. Propagated by seeds and cuttings.

indica. Tree to 30 ft.: lvs. oval to lanceolate, to 5 in. long, leathery: racemes to 4 in. long. India.

MAGA: *Montezuma.*

MAGNOLIA. *Magnoliaceæ.* Deciduous and evergreen trees and shrubs with entire lvs., large solitary terminal often very showy fls. which are white, pink, purple or yellow, and cone-like frs. composed of aggregated carpels; native in Asia, N. and Cent. Amer.

Magnolias are very ornamental as specimen trees and sometimes are planted in avenues. The evergreen sorts are not hardy far North. The species that bloom in early spring in advance of the leaves are most striking in appearance. Fertile soil that holds moisture is best. They transplant usually with difficulty and this should be undertaken before new growth starts. Propagated by seeds sown in fall or stratified; also by green cuttings under glass, by layers put down in spring and transplanted to pots the following summer, and named varieties by grafting on *M. acuminata.* In the following list, the plants are deciduous unless otherwise stated.

acuminata. CUCUMBER-TREE. Tree to 100 ft.: lvs. elliptic to oblong-ovate, to 10 in. long, pubescent beneath: fls. with the lvs., greenish-yellow, to 3 in. long: fr. red, to 4 in. long. N. Y. to Ga. and Ark. Var. **cordata** (*M. cordata*) has broader lvs. and canary-yellow fls. Ga.

alba superba: *M. Soulangeana* var. *alba.*

Alexandrina: *M. Soulangeana* var.

auriculata: *M. Fraseri.*

Campbellii. Tree to 80 ft.: lvs. elliptic-oblong to ovate, to 1 ft. long, glaucous beneath: fls. before the lvs., pink outside, pink and white inside, to 10 in. across: fr. greenish-brown, to 8 in. long. Himalayas.

Candolleana: *M. Soulangeana* var.

compressa: *Michelia compressa.*

conspicua: *M. denudata.*

cordata: *M. acuminata* var.

denudata (*M. conspicua*). Tree to 50 ft.: lvs. obovate, to 7 in. long, slightly pubescent beneath: fls. before lvs., white, fragrant, to 6 in. across: fr. brownish, to 5 in. long. China.

discolor: *M. liliflora.*

fœtida: *M. grandiflora.*

Fraseri (*M. auriculata*). Tree to 50 ft.: lvs. spatulate-obovate, to 1½ ft. long, the base cordate-auriculate: fls. with lvs., white, fragrant, to 10 in. across: fr. rose-red, to 5 in. long. Va. to Ga. and Ala.

fuscata: *Michelia fuscata.*

glauca: *M. virginiana.*

gloriosa: *M. grandiflora* var.

gracilis: *M. liliflora* var.

grandiflora (*M. fœtida*). BULL BAY. Noble evergreen variable tree to 100 ft.: lvs. obovate-oblong, to 8 in. long, very thick, shining above, mostly rusty-tomentose beneath at least when young: fls. white, fragrant, to 8 in. across: fr. rusty-tomentose, to 4 in. long. N. C. to Fla. and Tex. Var. **gallissoniensis** is very hardy. Var. **gloriosa** has larger fls., to 1 ft. or more across. Var. **lanceolata** (var. *exoniensis*, var. *stricta*) has narrower lvs. and pyramidal habit. Var. **rotundifolia** has very broad nearly blunt lvs.

Halleana: *M. stellata.*

hypoleuca: *M. obovata.*

Kobus (*M. Thurberi*). Tree to 30 ft.: lvs. obovate, to 4 in. long, pale beneath: fls. before the lvs., white, 4 in. across: fr. brown, to 5 in. long. Japan. Var. **borealis** is a pyramidal form with larger lvs.

Lennei: *M. Soulangeana* var.

liliflora (*M. purpurea. M. discolor*). Shrub to 10 ft.: lvs. obovate to oval, to 7 in. long, pale beneath: fls. before the lvs., purple outside, white inside, to 4 in. long: fr. brownish. China. Var. **gracilis** (*M. gracilis*), lvs. narrower, fls. dark purple, smaller. Var. **nigra** (*M. Soulangeana* var. *nigra*) has larger fls. dark purple outside, pale purple inside.

macrophylla. LARGE-LEAVED CUCUMBER-TREE. Tree to 50 ft.: lvs. oblong-obovate, to 3 ft. long, cordate-auriculate at base, glaucous and pubescent beneath: fls. with the lvs., white, fragrant, to 1 ft. across: fr. rose, to 3 in. long. Ky. to Fla. and La.

Norbertiana: *M. Soulangeana* var.

obovata (*M. hypoleuca*). Tree to 100 ft.: lvs. obovate, 1 ft. and more long, glaucous and pubescent beneath: fls. with the lvs., white, fragrant, to 7 in. across: fr. scarlet, to 8 in. long. Japan.

parviflora. Tree to 30 ft.: lvs. elliptic to obovate, to 6 in. long, glaucous beneath: fls. with the lvs., white, fragrant, to 4 in. across, sepals pink: fr. crimson, to 1½ in. long. Japan, Korea.

purpurea: *M. liliflora.*

rustica: *M. Soulangeana* var.

salicifolia. Tree to 30 ft.: lvs. elliptic to oblong-lanceolate, to 5 in. long, glaucous beneath: fls. before the lvs., white or sometimes purplish at base, fragrant, to 5 in. across: fr. rose, to 3 in. long. Japan.

Soulangeana. Hybrid between *M. denudata* and *M. liliflora*, common in cult. in many forms and hardy N.: small tree: lvs. obovate: fls. before the lvs., purplish outside, white inside, to 6 in. across. Some of the hort. vars. are: **alba** (var. *alba superba*), fls. white; **Alexandrina**, deep purple at base outside; **Candolleana**, fls. white tinged with purple at base; **Lennei** (*M. Lennei*), lvs. broader, fls. rosy-purple outside; **Nor-**

bertiana, late-blooming; **rustica** (*M. rustica flore-rubro*), fls. rose-red; **speciosa**, fls. white striped outside with purple; **spectabilis**, fls. white.

stellata (*M. Halleana*). STARRY M. Shrub or tree to 15 ft.: lvs. obovate-oblong, to 5 in. long, dull green above: fls. before the lvs., white, fragrant, 3 in. across: fr. red, 2 in. long. Japan. Var. **rosea** has fls. pink outside.

stricta: *M. grandiflora* var. *lanceolata*.

subrotunda: a form of *M. grandiflora*.

Thompsoniana. Hybrid between *M. tripetala* and *M. virginiana*, with fragrant fls. to 6 in. across.

Thurberi: *M. Kobus*.

tripetala. UMBRELLA-TREE. Tree to 40 ft.: lvs. oblong-obovate, to 2 ft. long, pale and pubescent beneath: fls. with the lvs., white, of unpleasant odor, to 10 in. across: fr. rose, to 4 in. long. Pa. to Ala. and Miss.

Victoria: form of *M. grandiflora*, lvs. very red-rusty underneath.

virginiana (*M. glauca*). SWEET BAY. Shrub or tree to 60 ft., half-evergreen in the S.: lvs. oblong or elliptic, to 5 in. long, glaucous-gray beneath: fls. with the lvs., white, fragrant, to 3 in. across: fr. red, to 2 in. long. Mass. to Fla. and Tex.

Watsoni. Tree to 25 ft.: lvs. obovate, to 7 in. long, glaucous and pubescent beneath: fls. with the lvs., white with pink sepals, fragrant, to 6 in. across: fls. crimson, about 2 in. long. Habitat unknown, perhaps a hybrid.

Wilsonii. Tree to 25 ft.: lvs. oblong, to 5 in. long, silky-tomentose beneath: fls. with the lvs., white, fragrant, to 5 in. across: fr. crimson, 2½ in. long. China.

MAGNOLIACEÆ. MAGNOLIA FAMILY. Trees, shrubs or vines, of 10 genera in N. Amer. and Asia, with entire or lobed lvs., usually bisexual fls. with 3 sepals, 6 or more petals, numerous stamens, 1-celled ovary, and fr. a follicle or samara often aggregated into cones. The family contains many ornamental genera, as Drimys, Illicium, Kadsura, Liriodendron, Magnolia, Michelia, Schizandra, Tetracentron.

MAHALA MAT: *Ceanothus prostratus*.

MAHERNIA. *Sterculiaceæ.* African herbs and subshrubs with alternate usually deeply cut lvs., drooping bell-shaped fls., and capsular frs. One is an ornamental subject for the greenhouse, hanging-baskets, or out-of-doors in the S. Of easy cult. Propagated by cuttings.

odorata: *M. verticillata*.

verticillata (*M. odorata*). HONEY-BELL. Straggly subshrub, mostly with an herbaceous appearance under glass, with branches to 1 ft. high: lvs. to 1 in. long, cut into linear divisions: fls. yellow, very fragrant, 2 on a st., in winter and spring. S. Afr.

MAHOBERBERIS. *Berberidaceæ.* A genus founded to include a hybrid between *Mahonia Aquifolium* and *Berberis vulgaris*. **M. Neuberti** (*Berberis Neuberti*). Shrub to 6 ft., evergreen or nearly so, without spines: lvs. simple, to 3 in. long, toothed or spiny, or sometimes of 3–5 lfts. all on same plant: not known to bloom. Var. **latifolia** (*Berberis latifolia* and *ilicifolia*) has broader lvs. Hardy N.

MAHOE: *Hibiscus tiliaceus*.

MAHOGANY: *Swietenia*. **Bastard**: *Eucalyptus botryoides*. **Mountain**: *Cercocarpus*. **Red**: *Eucalyptus resinifera*. **Swamp**: *Eucalyptus robusta*.

MAHONIA (*Odostemon*). *Berberidaceæ.* Evergreen thornless shrubs with alternate pinnate lvs. with mostly spiny-toothed lfts. (in which they are distinguished from the true barberries), yellow fls. in racemes or panicles, and fr. commonly a dark blue bloomy berry; native in Asia, N. and Cent. Amer.; by some writers included in Berberis.

Some of the mahonias are hardy in the northern states in sheltered places or with protection. They should be guarded from the wind and hot sun. They are excellent for ground-cover and similar uses wherever hardy, for the foliage is attractive and durable. Propagated by seeds, suckers, layers and cuttings of half-ripe wood under glass.

Aquifolium (*Berberis Aquifolium. M. Murrayana*). HOLLY M. or BARBERRY. To 3 ft. or more: lfts. ovate 5–9, to 3 in. long, the petioles to 2 in. long, glossy dark green above: racemes to 3 in. long. B. C. to Ore.; hardy in N. Y. and S. New England. Var. **dictyota**. To 1 ft. or less: lfts. broad-ovate, netted, shining and yellow above, with 10–20 spines terminating teeth: racemes dense, 1 in. or less long. Calif.

Bealei (*Berberis Bealei*; see *M. japonica*). To 12 ft.: lfts. 9–15, ovate, to 5 in. long, with few large teeth, stiff, petioles ¾ in. or less long: racemes to 6 in. long, fragrant. China; less hardy than *M. Aquifolium*, but roots persist.—Lvs. somewhat glaucous underneath.

fascicularis: *M. pinnata*.

Fortunei (*Berberis Fortunei*). To 6 ft.: lfts. 5–9, lanceolate, to 5 in. long: racemes to 6 in. long. China; adapted to Calif. and other mild climates.

Fremontii (*Berberis Fremontii*). DESERT M. To 12 ft.: lfts. 3–7, ovate-oblong to lanceolate, to 1½ in. long, with few large teeth, stiff, petioles very short: racemes few-fld. Colo. to Tex. and Calif.; hardy in Va. region.

japonica. The plant grown under this name is *M. Bealei*; the true *M. japonica* is probably not in cult. in N. Amer.: it has less stiff or rigid lfts. yellowish-green underneath, and longer lax racemes and drooping fls.

Murrayana: *M. Aquifolium*.

nepalensis (*Berberis nepalensis*). To 10 ft. and more: lfts. 5–25, ovate-oblong, to 4 in. long, with few teeth: racemes to 1 ft. long. Himalayas; planted in Calif. and other mild climates.

nervosa (*Berberis nervosa*). OREGON-GRAPE. To 2 ft.: lfts. 11–19, ovate to ovate-lanceolate, to 3 in. long, stiff, petioles to 5 in. long, shining, pale beneath: racemes to 8 in. long. B. C. to Calif.; hardy in N. Y. and S. New England.

Nevinii (*Berberis Nevinii*). To 8 ft.: lfts. 5, oblong, to 1¼ in. long, petioles very short: racemes few-fld. Calif., where it is now planted.

pinnata (*Berberis pinnata. B.* and *M. fascicularis*). To 12 ft.: lfts. 7–13, ovate or ovate-lanceolate, to 2½ in. long, petioles very short: racemes to 3 in. long. Calif. to Mex.; adapted to warmer parts of the country.

repens (*Berberis repens*). To 1 ft., stoloniferous: lfts. 3–7, ovate, to 2½ in. long, bluish-green, petioles to 1 in. long: racemes to 3 in. long. B. C. to Calif.; hardy in N. Y. and New England.

Swaseyi (*Berberis Swaseyi*). To 4 or 5 ft.: lfts. 5–11, oblong-lanceolate, rather thin, netted, to ¾ in. long: infl. bearing broad ovate bracts: fr. red. Tex.

trifoliolata (*Berberis trifoliolata*). AGARITA, ALGERITA. To 8 ft.: lfts. 3, oblong or lanceolate, coarsely toothed, stiff, petioles to 2 in. long: racemes few-fld.: fr. red. Tex., New Mex., Mex.; somewhat planted in Tex., etc., berries gathered for jelly; known to Mexicans as Agrito.

MAIANTHEMUM (*Unifolium*). *Liliaceæ.* Low per. herbs with slender roots and creeping rhizomes, simple 2–3-leaved sts., and small white fls. in terminal racemes, the 4 segms. distinct; useful for colonizing in shady places and of easy cult. Propagated by division.

bifolium (*M. Convallaria. Smilacina bifolia*). To 9 in.: pubescent: st.-lvs. triangular-ovate, cordate with deep and open sinus, petiole to 1 in. long: racemes about 1 in. long. Eu., Asia.

canadense. To 7 in., pubescent: lvs. 1–3, ovate, heart-shaped at base, very short-petioled: racemes to 2 in. long. Newf. to N. C. and S. D.

Convallaria: *M. bifolium.*

dilatatum. Prevailingly larger than the others, glabrous, with stouter rootstock: st.-lvs. often 3, broadly ovate-cordate, nearly or quite as broad as long, with very deep sinus, margins crenulate: fls. large, truncate or retuse at base. Calif. to Alaska and Japan.

MAIDENHAIR-TREE: *Ginkgo biloba.* -Vine: *Calacinum complexum.*

MAILE: *Alyxia olivæformis.*

MAIRANIA: *Arctous.*

MAIZE: *Zea Mays.*

MAJORANA. *Labiatæ.* Per. herbs or subshrubs with aromatic herbage, usually woolly or hairy, and 2-lipped fls. in whorls in thick clustered spikes; grown as sweet-herbs.

Sweet marjoram is grown as an annual as it winter-kills easily unless carefully protected. Propagated by seed; the young seedlings are tender and require shading. Successional plantings are usually made during the summer in hotbeds or coldframes. Plants should not be closer than 6 inches in rows 12 inches apart. They are harvested just before blooming.

hortensis (*Origanum Majorana*). SWEET OR ANNUAL MARJORAM. Per. but cult. as an ann., to 2 ft.: lvs. oval, to 1 in. long, entire, petioled: fls. purplish or whitish. Eu.

Onites (*Origanum Onites*). Per.: lvs. ovate, sessile, slightly toothed: fls. a little larger than in *M. hortensis.* S. E. Eu., Asia Minor, Syria.

MALACHE: *Pavonia.*

MALACHODENDRON: *Stewartia pentagyna.*

MALACHRA. *Malvaceæ.* Trop. American hairy per. herbs or shrubs with toothed or lobed lvs. and fls. in heads; one species may be grown under glass or in the open far S. for ornament.

radiata. To 8 ft., with stiff yellowish hairs: lvs. to 5 in. across, deeply 3–5-parted: fls. rose, subtended by involucre of narrow bracts. Trop. Amer., trop. Afr.

MALACOCARPUS. *Cactaceæ.* Globose or short-cylindric plants, simple or clustered, ribs usually straight, areoles felted: fls. from the center of the plant, short and broad, commonly yellow, the ovary bearing scales with wool and perhaps bristles in the axils: S. American, about 30 species. Treatment as for Echinocactus. See *Cacti.*

Leninghausii (*Echinocactus Leninghausii*). St. slender and cylindric, to 3 ft. long and 4 in. diam., ribs about 30 and obtuse, radials about 15, centrals 3 or 4 and longer: fls. 2 in. across, yellow. S. Brazil.

mammulosus (*Echinocactus mammulosus. E. submammulosus*). Plant simple and nearly globose, to 3 in. high, shining green, ribs 18–25, radials 20–30, centrals 2–4: fls. about 1½ in. long, yellow. Brazil to Argentina.

Ottonis (*Echinocactus Ottonis* vars.). Simple or cespitose, globular or perhaps depressed, 2 in. or so diam., ribs 10 and broad, spines needle-like and short: fls. 2 in. or so long, yellow. S. Brazil to Argentina.

submammulosus: *M. mammulosus.*

tabularis (*Echinocactus tabularis*). Simple and globose or short-columnar, ribs 16–18 and glaucous, radials 16–18, central spines 4: fls. 2 in. or more long, yellow. Brazil or Uruguay.

MALACOTHRIX. *Compositæ.* Herbs or woody-based plants of W. N. Amer. with mostly basal lvs. and heads of yellow, white or pinkish ligulate fls. on scape-like sts.; pappus of bristles. Sometimes grown for ornament.

californica. Ann. to 1 ft.: lvs. all basal, woolly at least when young, pinnately parted into narrow-linear segms.: sts. not branched above: heads to 1¾ in. across, canary-yellow, Sonchus-like, Apr.–June. Calif.

glabrata (*M. californica* var. *glabrata*). Sts. usually branched above; plant glabrous except involucre. Nev., Calif., Ore.

MALANGA: *Xanthosoma.*

MALAXIS: *Microstylis unifolia.*

MALCOMIA (see p. 9). MALCOLM STOCKS. *Cruciferæ.* Mostly low grayish ann. and per. plants of the Medit. region and eastward, with entire or pinnatifid lvs. and elongated pods or siliques. One or two of them grown as flower-garden subjects for the lilac, pink-purple or white small but profuse fls.; not scented. The genus is distinguished by technical characters. Propagated by seeds, either started indoors or sown where plants are to stand.

flexuosa. Ann., with obovate or oblong entire lvs. and pedicels as thick as the pods which are fleshy and recurved.—Plants grown under this name are likely to be *M. maritima.*

littorea. Per., white-tomentose, rather stiff, to 12 in.: lvs. very narrow, entire: fls. purple.—Will bloom first year from seed.

maritima. VIRGINIAN STOCK. Diffuse ann., with broadened petioled entire obtuse oblong or elliptic lvs.: fls. lilac and reddish to white, about ½ in. long: pods erect or spreading, not fleshy.

MALE-BERRY: *Lyonia ligustrina.*

MALEPHORA. *Aizoaceæ.* Segregate from Mesembryanthemum (which see), branched perennials with crowded linear or 3-angled lvs. **M. Thunbergii** (*Mesembryanthemum Thunbergii* and *læve*) is prostrate with short erect branches, 1 ft. or more: lvs. 3-angled, somewhat curved, green, punctate, to 2½ in. long: fls. solitary, yellow, reddish outside, petals twice longer than calyx. S. Afr.

MALLOTUS. *Euphorbiaceæ.* Shrubs or trees native in trop. Asia and Afr., with mostly alternate simple lvs., diœcious apetalous fls. in panicles, racemes or spikes, and capsular frs.; sometimes planted in S. Calif. for ornament.

ricinoides. High shrub or spreading tree: lvs. broadly ovate, to 10 in. across: fls. in spikes 6 in. or more long: caps. densely tomentose, ½ in. across. Australia.

MALLOW: *Malva.* **False-:** *Malvastrum.* **Globe-:** *Sphæralcea.* **Jews-:** *Corchorus olitorius.* **Marsh-:** *Althæa officinalis.* **Musk-:** *Hibiscus Abelmoschus.* **Poppy-:** *Callirhoë.* **Prairie-:** *Malvastrum coccineum.* **Rose-:** *Hibiscus.* **Tree-:** *Lavatera.*

MALOPE. *Malvaceæ.* Ann. herbs native in the Medit. region, having alternate simple lvs. and large fls. solitary in the axils; of simple cult. in the flower-garden. Propagated by seeds.

grandiflora: *M. trifida* var.

trifida. To 3 ft.: lvs. 3-lobed, toothed: fls. rose or purple, to 3 in. across. Spain, N. Afr. Var. **alba** has white fls.; **grandiflora** large deep rose-red fls. with darker veins; **purpurea** deep purple-red fls.; **rosea** rose-colored fls.

MALORTIEA. *Palmaceæ.* Diminutive spineless monœcious shade-palms of Cent. Amer., allied to Chamædorea, pinnate-lvd. or pinnate-veined, that have been planted in

S. Calif., and are somewhat known under glass; they usually do not exceed about 2–3 ft. in total height; fl.-clusters from the lower axils; stamens 6–12, and in this character differing from Reinhardtia with which they are sometimes united. See *Palm.*

gracilis. St. ringed, 18–30 in. tall: lvs. less than 1 ft. long and broad, pinnatisect into a few very broad notched segms. often with slits near the base. Guatemala.

simplex. Low and cespitose, to 3 ft. or so: lvs. mostly simple, deeply sharp-notched except near base of blade. Costa Rica.

Tuerckheimii. Sts. very slender, about 16 in. high: lvs. simple, 6 in. long and 2 in. broad, crenulate on sides and apex. Guatemala.

MALPIGHIA. *Malpighiaceæ.* Trop. American small trees or shrubs, reaching the southernmost U. S., with opposite simple lvs., red, purple or white fls. usually in axillary umbels or corymbs, and fr. a drupe with 3 winged or crested seeds; grown for ornament and *M. glabra* for the edible fr. which is made into jam or preserves. Propagated by seeds and cuttings.

coccigera. Bush to 3 ft.: lvs. small, to ¾ in. long, with coarse spiny teeth resembling holly: fls. pink, solitary or 2 together: frs. red, about ⅓ in. diam. W. Indies.

glabra. Barbados-Cherry. Variable shrub to 10 ft.: lvs. ovate to lanceolate, to 3 in. long, entire: fls. rose, in 3–8-fld. umbels: frs. red or scarlet. acid, size of a small cherry or less. S. Tex. and trop. Amer.

MALPIGHIACEÆ. Malpighia Family. Trees or shrubs or sometimes woody herbs, of about 55 genera widely distributed mostly in the tropics, characterized by usually opposite simple lvs., bisexual somewhat irregular polypetalous fls. with 5 sepals and mostly prominently clawed petals, 5 or 10 stamens, prevailingly superior 3-celled or -parted ovary, and fr. commonly of 3 nut-like parts or sometimes a samara or a drupe. The following genera are grown for ornament or the edible fr.: Malpighia, Stigmaphyllon, Thryallis, but the family has small hort. significance in the U. S.

MALTESE CROSS: *Lychnis chalcedonica.*

MALU CREEPER: *Bauhinia Vahlii.*

MALUS. The Apples. *Rosaceæ.* By Linnæus the apples and pears were kept together in the genus Pyrus. Soon thereafter Philip Miller in his Gardeners Dictionary separated the apples in the genus Malus, and this generic name has latterly been revived by many authors. The technical distinctions between the two genera are slight and of doubtful validity when all the species around the world are taken into account. The pome tribes of the Rose family have been subjected to rather extreme subdivision and there may be a reaction from it. If Malus and Pyrus are to be disjoined, then one should be ready to consider similar separations in Rubus, Prunus, Vitis, Euphorbia, Oxalis, Vaccinium, Pinus, Œnothera and many others, with the consequent changes in horticultural usage. There is not yet a consensus of opinion on many of these segregations. In this book the apples are included under Pyrus, but the names in Malus are given there in the synonymy for the convenience of those who prefer to keep the two genera separate. See *Pyrus Malus.*

MALVA. Mallow. *Malvaceæ.* Herbs with alternate lobed or dissected lvs. and rose or white fls. solitary or clustered in the axils.

Mallows are of easy cultivation in the flower-garden or border. Sow seed where plants are to stand. The perennials may also be propagated by division and cuttings.

Alcea. Per. to 2 ft., making a clump: st.- lvs. 5-parted, the lobes toothed or cut: fls. deep rose to white, to 2 in. across. Eu.; nat. in E. U. S.

borealis. Ann. or bien. to 3 ft.: lvs.rounded, wavy-margined, slightly lobed: fls. pinkish, about ½ in. across. Eu.; nat. in Calif.

capensis: *Malvastrum capense.*

chinensis: *M. verticillata.*

crispa. Curled M. Unbranched thick-stemmed straight ann. to 8 ft.: lvs. rounded, 5–7-lobed or -angled, with crisped and curled margins: fls. whitish, ¼ in. across. Eu.

Durieui: the plant grown under this name is apparently *M. sylvestris* var. *mauritiana.*

mauritiana: *M. sylvestris* var.

miniata: *Sphæralcea cisplatina.*

moschata. Musk M. Per. to 2 ft.: st.- lvs. 5-parted, the lobes again cut into narrow divisions: fls. rose or white, to 2 in. across. Eu.; nat. in N. Amer. Var. **alba** has white fls.

parviflora. Ann. or bien. to 3 ft.: lvs. round, shallowly 7-lobed: fls. pinkish, about ⅙ in. long. Eu.; nat. in N. Amer.

pulchella: *M. verticillata.*

sylvestris. Bien., usually grown as ann., to 3 ft.: lvs. rounded, with 5–7 wavy lobes: fls. purple-rose, 1 in. and more across. Eu.; nat. in N. Amer. Var. **mauritiana** grows to 4 ft., with large more showy purple fls. sometimes having deeper lines.

verticillata (*M. chinensis. M. pulchella*). Ann. or per. to 4 ft.: lvs. 5–6-lobed: fls. pink, sessile. Eu. to China.

MALVACEÆ. Mallow Family. Some 40–50 genera in temp. and trop. regions around the world, furnishing many ornamental subjects, a few food, fiber and medicinal plants, and one the cotton of commerce; it is a well-marked family. Herbs, shrubs or trees with alternate simple lvs. which are sometimes deeply palmately lobed or almost compound, regular polypetalous mostly bisexual fls. having 5 sepals and petals, many stamens that are united into a column around the pistil, superior several-celled ovary, and fr. sometimes berry-like but usually capsular or the carpels cohering and falling away as separates. The following genera are herein treated: Abutilon, Althæa, Anoda, Callirhoë, Cristaria, Gaya, Gossypium, Hibiscus, Hoheria, Ingenhouzia, Kitaibelia, Kokia, Kosteletzkya, Lagunaria, Lavatera, Malachra, Malope, Malva, Malvastrum, Malvaviscus, Montezuma, Pavonia, Plagianthus, Sidalcea, Sphæralcea, Thespesia, Wercklea.

MALVASTRUM. False-Mallow. *Malvaceæ.* Herbs and subshrubs with alternate entire or lobed lvs. and purple, red or yellow fls. axillary or in terminal spikes; carpels falling away from the axis at maturity; cult. in the flower-garden or sometimes in the greenhouse. Propagated by cuttings under glass or by seeds.

capense (*Malva capensis*). To 4 ft., shrubby: lvs. toothed, 3-lobed or angled: fls. purple, 1–2 in the axils. S. Afr.

coccineum. Prairie-Mallow. Per., with woody tap-root, branching silvery-pubescent top to 6 or 10 in. high: lvs. parted into narrow divisions: fls. brick-red, to nearly 1 in. across, in short close terminal spikes or racemes. Man. to B. C. and to Tex. and New Mex.

fasciculatum (*M. Thurberi. Sphæralcea fasciculata*). To 15 ft. and sometimes tree-like: lvs. entire or lobed, densely pubescent: fls. rose-purple, in spikes or clusters. S. Calif., Ariz. Var. **laxiflorum** has fragrant fls. in a loose panicle.

hypomadarum. To 10 ft.: lvs. variable, commonly 3-lobed and toothed: fls. white with rose-purple eye, solitary or few in axils. S. Afr.

Thurberi: *M. fasciculatum.*

MALVAVISCUS (*Achania*). *Malvaceæ.* Trop. American trees and shrubs with alternate toothed or lobed lvs. and showy red fls. solitary in the axils or in racemes; planted in the greenhouse or out-of-doors in the S. Propagated by seeds and greenwood cuttings.

arboreus (*Achania arborea*). The plants usually grown under this name are probably *M. mollis* from which *M. arboreus* differs in the smaller lvs. which are hairy but not velvety and the smaller fls. Trop. Amer.

candidus. Shrub or tree to 20 ft.: lvs. 3–5-lobed: fls. white, to 3 in. long. Mex.

Conzattii. Shrub: lvs. cordate-ovate or the upper ones oval, short-petioled, usually not lobed, crenate, nearly or quite obtuse, glabrous or with only a few scattered hairs on either side: fls. red, to 2 in. long. Mex., Guatemala.—Probably not in cult. in N. Amer., the plant so named being *M. grandiflorus.*

Drummondii. To 9 ft.: lvs. usually slightly lobed or angled, obtuse or acute: fls. to 1 in. long: fr. edible, red and berry-like. Mex., Tex.

grandiflorus. To 15 ft.: lvs. toothed, sometimes indistinctly lobed, ovate-oblong, long-acuminate: fls. to 2½ in. long, red. Mex.; commonly planted in the S.

mollis. Low shrub: lvs. often angled or lobed, toothed or wavy-margined, velvety-pubescent beneath: fls. to 1½ in. long. Mex. to Colombia.

MAMEY: *Mammea americana.*

MAMILLOPSIS. *Cactaceæ.* Small globular or short-cylindric cespitose cacti, the body hidden in a mass of soft white hair-like spines, separated from Mammillaria; 2 species. See *Cacti.*

senilis (*Mammillaria senilis*). To 6 in. high and about half as thick, tubercles more or less conic and not in ribs, spines 30–40: fls. orange-yellow, about 2½ in. long and nearly as broad. Mex.

MAMMEA. *Guttiferæ.* Trop. trees with opposite simple lvs., polygamous fls. solitary or few in the axils, and drupaceous fr.; widely cult. in the tropics for the edible fr. and a liqueur is also distilled from the fls.

The mamey will not stand more than two or three degrees of frost. Propagated by seeds and probably also by inarching and budding.

americana. Mamey. Mammee-Apple. To 60 ft.: lvs. to 8 in. long, thick and glossy, with many cross-veins, blunt: fls. white, fragrant, 1 in. across: fr. to 6 in. across, with russet roughened skin and bright yellow juicy flesh. W. Indies, N. S. Amer.

MAMMILLARIA (*Neomammillaria*). *Cactaceæ.* Small condensed, depressed, hemispherical or short-cylindric spiny cacti of 150 species in Mex. and a few in the S. W. U. S., one in N. S. Amer., popular as fancier's pot plants for conservatory and house, many of which are in the collections: surface broken up into prominent tubercles standing more or less spirally that commonly bear wool or hairs or bristles and crowned by spine-areoles; spines all alike or differentiated as radials and centrals: fls. diurnal, small, from axils of old tubercles, somewhat bell-shaped, red, pink, yellow or white: juice milky in some kinds. Cult. as for Echinocactus. See *Cacti.*

By some writers the name is spelled *Mamillaria;* it was not so spelled by Haworth who founded the genus on *Cactus mammillaris* of Linnæus, who also wrote the double *m.* The two *m*'s are accepted by Britton and Rose in the standard monograph of the family, although they adopt the name Neomammillaria because of the existence of an older but unused Mammillaria amongst the algæ. The International Rules conserve Mamillaria as against Cactus.

aggregata: *Coryphantha aggregata.*

angularis: *M. compressa.*

applanata. Plant much flattened endwise, tubercles somewhat angled and axils naked, radials 10–18, central solitary: fls. cream-colored, inner segms. 1 in. long, green-striped in center. Tex.—Early-flowering.

arizonica: *Coryphantha arizonica.*

bicolor: *M. geminispina.*

bocasana. Cespitose, forming mounds, the individuals globose and to 1½ in. diam., tubercles slender and terete, radials many long hairs, central solitary: fls. white. Mex.

Brownii: *Coryphantha robustispina.*

candida. Cespitose, the individuals globose and 2 in. or more diam., radials numerous, centrals 8–12: fls. rose-colored, nearly 1 in. long. Cent. Mex.

Caput-Medusæ: *M. sempervivi.*

carnea. Solitary, cylindric, to 3½ in. high, tubercles 4-angled and milky with woolly axils, spines 4: fls. flesh-colored, nearly or quite 1 in. long. Cent. and S. Mex.

Carretii. Solitary, globose and depressed, 2 in. or more diam., tubercles cylindric and axils naked, radials 14, central 1: fls. 1 in. long, white and rose. Probably Mex.

Celsiana. Subglobose and becoming cylindric, to 5 in. high, tubercles conic and woolly in axils, radials 24–26, centrals 4–7: fls. red. S. Mex.

centricirrha: *M. magnimamma.*

cirrhifera: *M. compressa.*

clava: *Coryphantha clava.*

clavata: *Neolloydia clavata.*

compressa (*M. angularis. M. cirrhifera*). In clumps, individuals cylindric, bluish-green, tubercles short and axils woolly, principal spines commonly 4: fls. pinkish, to ½ in. long. Cent. Mex.

conoidea: *Neolloydia conoidea.*

cornifera: *Coryphantha cornifera.*

decipens. Mostly cespitose, tubercles soft and cylindric with 2 or 3 bristles in axils, radials 7–9, central 1: fls. white tinged pink, about ½ in. long. Mex.

dioica. Solitary or clustered, cylindric, to 10 in. or more high, tubercle axils woolly and setose, radials 11–22, centrals 3 or 4: fls. yellowish-white with purplish ribs, to about 1 in. long, somewhat diœcious. S. Calif. and adjacent Lower Calif.

disciformis: *Stromocactus disciformis.*

dolichocentra: *M. tetracantha.*

echinaria (*M. gracilis*). Cespitose, individuals short-cylindric and about 4 in. long, tubercles terete and with naked axils, spines light colored, the radials about 15 and central 1: fls. undescribed. Mex.

echinus: *Coryphantha echinus.*

elegans. Simple, obovoid to globose, 2 in. diam., tubercles ovoid and axils naked, radials 25–30 and bristle-like and white, centrals 1–3. Cent. Mex.—Different plants may pass as *M. elegans.*

elephantidens: *Coryphantha elephantidens.*

elongata (*M. stella-aurata* probably. *M. tenuis*). Making dense small clumps, individuals erect or ascending or prostrate to 4 in. long, with many interlacing spines, tubercles short and axils naked, spines usually all radial: fls. white or nearly so, about ¼ in. long. E. Mex.

erecta: *Coryphantha erecta.*

eriacantha. Solitary or cespitose, cylindric, to 6 in. high, tubercles spiral in 22 rows, radials about 20, centrals 2: fls. yellow, about ½ in. across. Cent. Mex.

fissurata: *Roseocactus fissuratus.*

formosa. Body somewhat club-shaped and sunken at apex, tubercles 4-angled, axils woolly, radials 20–22, centrals 6: fls. red. Mex.

geminispina (*M. bicolor. M. nivea*). Naturally cespitose, cylindric and somewhat glaucous, tubercles terete and axils woolly, radials 16–20 and very short, centrals 2–4 and longer: fls. dark red. Cent. Mex.

gigantea. Solitary or cespitose, depressed-globose, to 4 in. high and of great diam., axils woolly, radials 12, centrals 4–6: fls. yellowish-green. Mex.

gracilis: *M. echinaria.*

Grahamii: *M. microcarpa.*

gummifera. Body depressed-globose, to 4 in. or more high, tubercles angled, radials 10–12, centrals 1, 2 or 4: fls. brownish outside and reddish-white inside, about 1 in. long. N. Mex.

Halei: *Cochemiea Halei.*

Heeseana: *M. Petterssonii.*

Heyderi. Globose or at apex somewhat flattened, tubercles conic and woolly in axils, radials 20–22, central solitary: fls. pinkish. Tex. to N. Mex.

lasiacantha. Globose, to 1 in. high, tubercles small and axils naked, spines 40–60 and puberulent: fls. whitish or pink, about ½ in. long. W. Tex.

leona: *M. Pottsii.*

Lesaunieri. Plant simple, globose or a little elongated, tubercles conic with naked axils, radials 11–13, central solitary and short: fls. reddish, 1 in. long. Probably Mex.

longimamma: *Dolichothele longimamma.*

macrantha (*M. centricirrha* var. *macrantha*). Depressed-globose, about 1 in. high, tubercles ovoid and angled and the axils becoming naked, spines 1 or 2: fls. dark pink. Mex.

macromeris: *Coryphantha macromeris.*

magnimamma (*M. centricirrha*). Globose, to 4 in. diam., commonly cespitose, milky: tubercles conic and axils woolly when young, spines 3–5 the lower curved: fls. cream-colored. Cent. Mex.

mammillaris (*M. simplex*). Globose or short-cylindric, to about 2½ in. high, tubercles conic and axils slightly woolly, radials 10–12, centrals 3 or 4: fls. cream-color, about ⅜ in. long. Venezuela and adjacent isls.

meiacantha. Somewhat depressed, to 5 in. diam., tubercles angled and milky with naked axils, spines 5–9: fls. white with pink stripes. Tex., New Mex., N. Mex.

melanocentra. Short-cylindric and glaucous-green, tubercles strongly angled, radial spines 6, central solitary and black: fls. pinkish-red. Mex.

microcarpa (*M. Grahamii*). Globose to cylindric, sometimes clustered, to 3 in. high, tubercles small and axils naked, spines 15–30, centrals 1–3: fls. purplish and perhaps with whitish margins, to 1 in. long. Tex., Ariz. (perhaps Utah and Calif.), Mex.

micromeris: *Epithelantha micromeris.*

microthele. Allied to *M. elegans*: cespitose, the joints small and globose, axils naked or woolly, radials 22–24, centrals 2: fls. about ⅛ in. long, flesh-colored outside and white inside. Mex.

minima: probably *M. elongata.*

missouriensis: *Neobesseya missouriensis.*

mutabilis: *M. mystax.*

mystax (*M. mutabilis*). Globose to short-cylindric, flat-topped, to 6 in. high, tubercles many and milky, radials 8–10 and white, centrals 4 and one of them elongated: fls. dark red, about ¾ in. long. S. Cent. Mex.

neo-mexicana: *Coryphantha neo-mexicana.*

Nickelsæ: *Coryphantha Nickelsæ.*

nivea: *M. geminispina.*

Nuttallii: *Neobesseya missouriensis.*

octacantha: *Coryphantha octacantha.*

Parkinsonii. Cespitose, parts depressed to cylindric, to 6 in. high, glaucous, tubercles short and milky with woolly or bristly axils, radials 20 or more, centrals 2 or 4 or 5: fls. yellowish and small. Cent. Mex.

pectinata: *Coryphantha pectinata.*

perbella. Depressed-globose, glaucous-green, solitary or more or less cespitose, tubercles conic and axils woolly, radials 14–18, centrals 2: fls. reddish, nearly ½ in. long. Mex.

Petterssonii (*M. Heeseana*). Cylindric, to 8 in. or more and very spiny, tubercles terete and axils bristly, radials 10–12 and white with black tips, centrals 4: fls. not described. Mex.

phellosperma: *Phellosperma tetrancistra.*

plumosa. Clusters to 6 in. across, covered with white spines, tubercles very small and axils somewhat woolly, spines all radial and about 40, plumose: fls. white, nearly ¼ in. long. N. Mex.

polyedra. Solitary, cylindric or somewhat club-shaped, tubercles flattened and angled and axils bristly, spines 4: fls. reddish and inconspicuous. S. Mex.

Poselgeri: *Cochemiea Poselgeri.*

potosina. In the lists a plant allied to *M. geminispina:* resembles *M. Celsiana* in the spines but st. is elongated and tubercles milky. Mex.

Pottsii (*M. leona*). Somewhat cespitose, individuals cylindric to about 5 in. long, tubercles nearly hidden by spines, radials white and about 30, centrals 6–12 and stouter: fls. light purple, less than ½ in. long. Tex., Mex.

prolifera (*M. pusilla*). In low colonies, individuals globose or cylindric and 2 in. or more diam., tubercles conic and axilis bristly, radials many and hair-like, centrals 5–12 and stouter: fls. yellowish-white, small. Cuba, Hispaniola.

pusilla: *M. prolifera.*

radians: *Coryphantha radians.*

radiosa: *Coryphantha vivipara.*

recurvata: *Coryphantha recurvata.*

recurvispina: *Coryphantha recurvata.*

rhapidacantha: *Neolloydia clavata.*

rhodantha. Sts. cylindric and erect, to 1 ft. long, tubercles terete and axils sometimes bristle-bearing, radials 15–20 and white, centrals 4–6: fls. rose-colored, about ½ in. across. Mex.—Grown under many names.

robustispina: *Coryphantha robustispina.*

Roseana: *Cochemiea Poselgeri.*

Scheeri: *Coryphantha Muehlenpfordtii.*

Schelhasei. Forming large mound, individuals globose to short-cylindric, tubercles cylindric and axils somewhat woolly, radials 14–16 and bristle-like and white, centrals 3 and one of them hooked: fls. salmon or rose-color, 1 in. long. Mex.

Seitziana. Solitary or proliferous, cylindric, 4 in. or more high, axils woolly, spines 4: fls. rose-color, about 1 in. long. Mex.

sempervivi (*M. Caput-Medusæ*). Solitary or more or less cespitose, flattened above and narrowed below, tubercles short and milky and axils very woolly, radials 3–7 and shedding, centrals 2: fls. dull white with reddish lines. Cent. Mex.

senilis: *Mamillopsis senilis.*

setispina: *Cochemiea setispina.*

simplex: *M. mammillaris.*

Simpsonii: *Pediocactus Simpsonii.*

sphærica: *Dolicothele sphærica.*

spinosissima. Cylindric, to 12 in. long and 4 in. diam., densely covered with spines, tubercles very short and axils bristly, radials about 20, centrals 7 or 8: fls. purplish, about ½ in. long. Cent. Mex.—Known under many names.

stella-aurata: see *M. elongata.*

strobiliformis: a name of various applications; see *Escobaria.*

tenuis: *M. elongata.*

tetracantha (*M. dolichocentra*). Nearly globular, to 3 in. diam., tubercles obscurely angled and axils woolly, spines 4 and all radial: fls. pink to rose-color, small. Mex.

tetrancistra: *Phellosperma tetrancistra.*

tuberculosa: *Escobaria tuberculosa.*

uncinata. Globose or somewhat depressed and partly buried in soil, to 4 in. diam., tubercles short and milky and finally naked, radials 4–6, central mostly solitary: fls. reddish-white, nearly 1 in. long. Cent. Mex.

vivipara: *Coryphantha vivipara.*

Wildii. Somewhat cespitose, cylindric to globose, tubercles slender with rose-colored hairs and bristles in axils, spines pubescent the radials 8–10 and centrals 4: fls. white, ½ in. across. Mex.

Wrightii. Simple and depressed-globose, tubercles terete with axils naked, radials 8–15 and white, centrals 1–3 and stouter: fls. purple, 1 in. long. New Mex.

zephyranthoides. Depressed-globose to short-cylindric, to 3 in. high, tubercles nearly 1 in. long, radials 14–18 and white, centrals 1 or 2: fls. white with red stripes, to 1½ in. across. S. Mex.

MAMONCILLO: *Melicocca bijuga.*

MANDEVILLA. *Apocynaceæ.* Woody vines from trop. Amer., one grown in the greenhouse, or out-of-doors in the S., with opposite lvs., funnelform fls. in racemes, and fr. of 2 follicles; the genus differs from Dipladenia only in technical characters.

The mandevillas are grown in soil consisting of equal parts of peat and loam, with sand; they should not be planted in pots. Propagated by cuttings over bottom heat.

suaveolens. Chilean-Jasmine. Lvs. oblong-cordate, to 3 in. long, glaucous beneath: fls. white or pinkish, fragrant, 2 in. across. Argentina.

MANDRAGORA. Mandrake. *Solanaceæ.* Herbaceous perennials with thick or tuberous roots often having a human-like form of branching, lvs. undivided, and rather large bell-shaped fls. solitary or clustered among the foliage, whitish, blue-violet or purple; native Medit. and Himalayan region. Seldom. cult. but interesting for the medicinal qualities and for the old superstitions connected with it. The name mandrake is incorrectly applied also to *Podophyllum peltatum.* Propagated by seeds and division.

autumnalis. Similar to *M. officinarum*, but with smaller roots and lvs. and violet fls. S. Eu., N. Afr.

officinarum. To 1 ft., with spindle-shaped often branching root: lvs. ovate, sinuate-toothed, to 1 ft. long: fls. greenish-yellow, to 1 in. long. S. Eu.

MANDRAKE: *Mandragora.*

MANETTIA (*Lygistum*) *Rubiaceæ.* Twining evergreen herbs or shrubs with mostly opposite lvs. and white, yellow or red attractive fls. with tubular corolla and 4–5-lobed limb; native in trop. Amer.

Manettias are grown as trellis and rafter vines in the greenhouse, or planted out in the summer and in southern United States.. They need a night temperature of 55° and above. Propagated by cuttings of young growth over heat, and by seeds when available.

bicolor. Lvs. lanceolate, glabrous: fls. red with upper part yellow, ¾ in. long, solitary, calyx-lobes erect or spreading, style exserted. Brazil.

cordifolia: *M. glabra.*

glabra (*M. cordifolia*). Lvs. cordate-ovate, glabrous: fls. crimson, 1½ in. long, lobes revolute, solitary, stamens exserted. S. S. Amer.

inflata. Lvs. lanceolate, pubescent on veins beneath: fls. red tipped yellow, ¾ in. long, solitary, calyx-lobes leafy and reflexed, style included. Paraguay, Uruguay.—Sometimes mistaken for *M. bicolor.*

MANFREDA. *Amaryllidaceæ.* Fleshy bulbous herbs with basal lvs. and large nocturnal fls. in terminal spikes or racemes, the perianth-segms. united into a tube below. For cult. see *Agave.*

virginica (*Agave virginica*). To 6 ft.: lvs. to 2 ft. long and 2½ in. wide: fls. fragrant, greenish-yellow, about 2 in. long. Md. to Fla. and Tex.

MANGEL: *Beta vulgaris.*

MANGIFERA. *Anacardiaceæ.* Trop. Asian trees with leathery simple lvs., small polygamous fls. in terminal panicles, 1–5 stamens but often only 1 fertile, large fleshy drupaceous fr. with a compressed fibrous stone, edible and widely grown in the tropics.

The genus is known mostly for the mango, planted in southern Florida, warmest parts of California, and tropics for the large edible fruit. Trees should be planted 35 by 35 feet, in well-drained soil in regions free from frost, and in which there is dependable supply of moisture. Propagated by seeds, but budding, grafting, inarching are employed for named varieties.

indica. Mango. Evergreen tree to 90 ft. and sometimes with a spread of 125 ft.: lvs. stiffish, lanceolate, to 16 in. long: fls. pinkish-white, in Fla. blooming from Dec. to Apr.: fr. variable in size, shape and color, mostly ovoid-pointed or heart-shaped, commonly 3–5 in. long but may be shorter or longer, smooth, mostly yellow and reddish when ripe, containing 1 very large flat adhering stone or seed. N. India, Burma, Malaya.

MANGO: *Mangifera indica.*

MANGOSTEEN: *Garcinia Mangostana.*

MANGROVE: *Rhizophora.*

MANICOLE: *Euterpe edulis.*

MANIHOT. *Euphorbiaceæ.* Trop. American herbs, shrubs or trees with alternate mostly lobed lvs., monœcious fls. without petals borne in racemes, and capsular fr.; *M. esculenta* is extensively grown in trop. regions for the starchy roots which yield tapioca, cassava, and other food products; other species are a source of rubber.

Cassava thrives on rich sandy land. Propagated by cuttings of the stem into 4–6-inch pieces and planted 4 feet apart each way. In the United States the canes should be buried until spring and then cut into lengths. Some early-maturing races may be grown from seed. Roots should not be dug until ready for use, as they decay readily.

carthaginensis. Tree or tree-like, to 20 ft., with fleshy roots: lvs. to 5 in. long, 5–7-lobed, some of the lobes fiddle-shaped, lyrate or pinnatifid. Tex., Lower Calif. to N. S. Amer.

dulcis. Differs from *M. esculenta* in lvs. sometimes as much as 13-lobed, fr. cylindrical and not winged. S. Amer.—Has tuberous edible roots.

esculenta (*M. utilissima. Jatropha Manihot*). Cassava. Manioc. Tapioca-Plant. Shrub to 9 ft., with long tuberous edible roots: lvs. usually digitately parted into 3–7 lobes: fr. ½ in. across, 6-angled and narrowly winged. Brazil.—Of great importance in many countries as a food plant.

Glaziovii. Tree to 40 ft.: lvs. peltate, deeply 3–5-lobed into entire lobes to 4 in. long: caps. not wing-angled. S. Brazil.

utilissima: *M. esculenta.*

MANIOC: *Manihot esculenta.*

MANULEA. *Scrophulariaceæ.* Pubescent S. African or trop. African ann. or per. herbs or subshrubs with mostly opposite entire or dentate lvs. or sometimes all radical, tubular fls. with 5-lobed limb borne in spikes, racemes or panicles, and capsular frs. Confusion exists between the genera Chænostoma, Manulea and Sutera and their interpretation.

violacea. Ann. to 1 ft.: lvs. ovate to oblong, to 1 in. long, toothed: fls. violet, ½ in. long. S. Afr.—The proper name of this plant may be *M. antirrhinoides.*

MANZANITA: *Arctostaphylos.*

MAPLE: *Acer.* **Flowering:** *Abutilon.*

MAPLEWORT: *Aceranthus diphyllus.*

MARAH: *Echinocystis.*

MARANTA. *Marantaceæ.* Per. herbs native in trop. Amer. having basal and st.-lvs. sheathing at base and fls. in panicles or branched racemes; grown for the ornamental foliage and one species for the roots which furnish arrowroot and tapioca. Cult. as for *Calathea,* from which the genus differs in technical not obvious characters. Most of the plants grown as marantas are calatheas.

arundinacea. Arrowroot. To 6 ft., having starchy roots: lvs. to 1 ft. long and 4 in. across: fls. white. Trop. Amer. Var. **variegata** has lvs. variegated with yellow.

bella: *Calathea bella.*

bicolor (*Calathea bicolor*). To 15 in., tuber-bearing: lvs. to 6 in. long and 4 in. broad, wavy-margined, glaucous above spotted with brown and with light central stripe, light purple beneath: fls. white spotted and striped with violet. Brazil, Guiana.

Binotii: *Calathea zebrina* var.

Chantrieri: *Calathea Chantrieri.*

Closonii. Lvs. dark green variegated with pale yellow. Brazil.—Botanical position uncertain.

conspicua: *Calathea Lietzei.*

eximia: *Calathea eximia.*

fasciata: *Calathea fasciata.*

Gouletii: *Calathea Vandenheckei.*

Goveniana. Lvs. light green with dark markings. Botanical position uncertain.

illustris: *Calathea illustris.*

insignis: *Calathea insignis.*

Kegeliana: *Calathea Bachemiana.*

Kerchoveana: *M. leuconeura* var.

Kummeriana: *Ctenanthe Kummeriana.*

Legrelleana: *Calathea Legrelleana.*

leopardina: *Calathea leopardina.*

leuconeura. To 1 ft.: lvs. to 7 in. long and 3½ in. wide, light green above with white along midrib and veins and spotted toward margins, purple or glaucous beneath: fls. white striped purple. Brazil. Var. **Kerchoveana** has larger lvs. glaucous or spotted with red beneath. Var. **Massangeana** has smaller lvs. purple beneath.

Lietzei: *Calathea Lietzei.*

Lindeni: *Calathea Lindeniana.*

Louisæ: *Calathea Louisæ.*

Lubbersi: *Ctenanthe Lubbersiana.*

Luciana: *Calathea Luciana.*

Makoyana: *Calathea Makoyana.*

Massangeana: *M. leuconeura* var.

micans: *Calathea micans.*

Mosselli: hort. name.

musaica: *Calathea musaica.*

Oppenheimiana: *Ctenanthe Oppenheimiana.*

Porteana: *Stromanthe Porteana.*

princeps: *Calathea princeps.*

pulchella: *Calathea pulchella.*

regalis: a hort. variant of *Calathea ornata.*

roseo-lineata: probably a cult. form of *Calathea ornata.*

roseo-picta: *Calathea roseo-picta.*

Sanderiana: probably a variant ot *Calathea ornata.*

smaragdina: *Monotagma smaragdinum.*

splendida: *Calathea splendida.*

tubispatha: *Calathea Pavonii.*

undulata: *Calathea undulata.*

Vandenheckii: *Calathea Vandenheckei.*

Veitchiana: *Calathea Veitchiana.*

vittata: *Calathea vittata.*

Wallisii: *Calathea Wallisii.*

Warscewiczii: *Calathea Warscewiczii.*

zebrina: *Calathea zebrina.*

MARANTACEÆ. Maranta Family. Per. monocotyledonous herbs having tubers or rootstocks, forming clumps or colonies, mostly large sheathing lvs. and bisexual irregular fls. in clusters surrounded by spathe-like bracts, composed of 3 free sepals, 3 united petals, 1 fertile stamen and 5 petal-like sterile stamens or staminodia, inferior 1–3-celled ovary, and fr. a caps. or berry. A few genera are grown for the ornamental foliage, and tapioca is obtained from the root of one species of Maranta. The cult. genera are Calathea, Ctenanthe, Maranta, Monotagma, Stromanthe, Thalia. They are well-known greenhouse subjects.

MARATTIA. *Marattiaceæ.* Trop. ferns with thick rootstocks and large 2–3-pinnate lvs.; sori near margins of segms. Sometimes seen in greenhouse collections. For cult. see *Ferns.*

attenuata. Lvs. to 4 ft. long, on stalks to 4 ft. long, 3-pinnate, segms. to 6 in. long. New Caledonia.

Douglasii. Lvs. dark green, glossy, to 8 ft. long, on stalks to 5 ft. long, 3-pinnate, segms. ovate or oblong, to 1 in. long, toothed. Hawaiian Isls.

erecta: probably *Angiopteris evecta.*

fraxinea. Lvs. dark green and glossy, to 15 ft. long, on stalks to 2 ft. long, 2-pinnate, the thick fine-toothed lfts. to 6 in. long. S. Afr., Malaya, New Zeal.

pruinosa: probably *Angiopteris pruinosa.*

MARATTIACEÆ. Marattia Family. Five genera of trop. ferns with large mostly pinnate lvs. and fruit-dots separated or united on under side of lvs. Angiopteris and Marattia are grown in greenhouse collections.

MARGOSA: *Melia Azadirachta.*

MARGUERITE: *Chrysanthemum frutescens.* **Blue:** *Felicia amelloides.* **Golden:** *Anthemis tinctoria.*

MARGYRICARPUS. *Rosaceæ.* Evergreen shrubs native in the Andes and suitable for the rock-garden but not hardy in northern states: lvs. alternate, pinnate, the rachis spiny: fls. inconspicuous, without petals: fr. a berry or achene.

setosus. Pearl-Fruit. Prostrate, branches to 1 ft. high: lvs. 1 in. or less long, the lfts., linear and revolute at margins: fr. a white berry about ⅙ in. across. Ecuador to Patagonia.

MARIA: *Calophyllum antillanum.*

MARICA. *Iridaceæ.* Trop. per. herbs with short rootstocks, narrow basal lvs. and blue, yellow or white iris-like fls. of brief duration, in clusters near the end of flat, winged, leaf-like scapes.

Maricas are hardy in mild regions with winter protection, and thrive in Florida and similar climates. Propagated by division.

gracilis. Lvs. to 1½ ft. long and 1 in. across: fls. 2 in. across, the outer segms. white with yellow and brown markings, inner segms. small, blue. Mex. to Brazil.

longifolia. To 2 ft.: lvs. 1 in. across: fls. 2 in. across, yellow barred with brown. Brazil.

Northiana. To 3 ft.: lvs. to 2 ft. long and 2 in. across: fls. very fragrant, to 4 in. across, outer segms. white variegated at base, inner segms. violet variegated at base. Brazil.

MARIGOLD: *Tagetes.* Bur-: *Bidens.* Cape-: *Dimorphotheca.* Corn-: *Chrysanthemum segetum.* Fig-: *Mesembryanthemum.* Marsh-: *Caltha palustris.* Pot-: *Calendula officinalis.*

MARJORAM: *Origanum, Majorana.*

MARKET-GARDENING, as now prevailingly understood, is the raising of vegetables and perhaps small-fruits and other garden products for a market within driving distance. Truck-gardening or trucking is now defined to be the growing of a few products, as sweet potatoes, kale, spinach, in larger areas and on cheaper land so far from market as to require shipping facilities by rail or boat; yet the term truck-gardening was at first the same as market-gardening, denoting the raising of products that were hauled to market on trucks or wagons. There is no sharp line of demarcation between market-gardening and truck-gardening; but they are well set off from home-gardening, in which the garden is a scene of personal satisfactions and the products are intended for the family table.

MARLBERRY: *Ardisia paniculata.*

MARMALADE-BOX: *Genipa americana.* -Plum: *Achras Zapota.*

MARRAM: *Ammophila arenaria.*

MARRUBIUM. HOARHOUND. HOREHOUND. *Labiatæ.* Herbs, mostly silky or woolly, the lvs. wrinkled and toothed or cut; fls. small, 2-lipped, purplish or white, in many-fld. axillary whorls; one species is extensively used in confections and medicines, and a few others occasionally planted.

Propagated by division or by seeds sown in early spring; the latter method should give good plants for cutting the following year.

candidissimum. Differs from *M. vulgare* chiefly in the stiff spreading rather than recurved calyx-teeth. S. Eu.

catariæfolium. Ann. to 1 ft., pubescent: lvs. oblong, to ¾ in. long: fls. rose. Caucasus.

vulgare. COMMON H. Aromatic per. to 3 ft., white-woolly: lvs. ovate, to 2 in. long: fls. whitish, in summer. Eu., Asia; nat. in N. Amer.—An old-time sweet herb.

MARSDENIA. *Asclepiadaceæ.* Upright or twining shrubs of warm and trop. regions in Old and New Worlds, one of which is sometimes planted for ornament and hardy N.: lvs. opposite: fls. mostly small, paniculate or umbellate; corolla bell-, urn- or salver-shaped, with 5 scaly crown-lobes: follicles thick, often fleshy.

erecta (*Cynanchum erectum*). Erect more or less twining deciduous shrub, or the branches sometimes lopping: lvs. broad-ovate, 2–3 in. long, short-acuminate, base truncate or cordate: fls. white, fragrant, about ¼ in. across, mostly in axillary clusters. S. E. Eu. and W. Asia.

MARSILEA. PEPPERWORT. *Marsileaceæ.* Aquatic or paludose herbs with 4-parted clover-like floating lvs.; widely distributed.

Propagated by pieces of the runners. *M. Drummondii* requires moderate greenhouse temperature if grown in the North.

Drummondii. Lfts. covered with whitish hairs, wavy-margined. W. Australia.

quadrifolia. Lfts. glabrous, entire. Eu., Asia, and nat. in U. S.; likely to become a pest in ponds.

MARSILEACEÆ. MARSILEA FAMILY. Three genera of per. herbs rooting in mud of ponds and ditches, having 2–4-parted or thread-like long-petioled lvs. and spores borne in bodies known as sporocarps. Marsilea is grown in ponds and tanks. They are classified with the fern allies.

MARTINEZIA. *Palmaceæ.* Six or 8 trop. American monœcious strongly armed sometimes cespitose pinnate palms, spadices among the foliage and simply branched: pinnæ relatively few, alternate or grouped, mostly cuneate and with broad ends, petiole and rachis and sometimes midribs and blades with sharp long usually black spines: spathes conspicuous, hairy, tomentose or spiny; staminate fls. on upper part of branches; stamens 6: fr. globose or obovoid, size of cherry, 1-seeded. The Martinezias are native from Lesser Antilles to Colombia, Peru and Bolivia. Only one is much known in cult. See *Palm.*

caryotæfolia. Trunk solitary, to 30 ft. and more, 4–6 in. thick, ringed and with long black spines: lvs. 3–6 ft. and more long; pinnæ 6–14 in. long, most of them 3–6 in. broad and suddenly expanded near apex and narrower below, the end obscurely somewhat 3-lobed and variously toothed; spathe to 18 in. long, spiny toward the base: fr. about ¾ in. long, yellow. S. Amer. —Thrives in S. Fla. in sheltered positions.

corallina. The W. Indian representative, to be expected in cult.: spiny on trunk and petioles and rachis: pinnæ 12–20 in. long, not suddenly expanded at apex, with straight sides, ridged, toothed and jagged at end: spadix 3 ft. long, brown-pubescent and not spiny: fr. obovoid, ⅝ in. long.

MARTYNIA of gardens: *Proboscidea.*

MARTYNIACEÆ. MARTYNIA FAMILY. American sticky-hairy more or less succulent herbs of 5 genera in the latest monographic treatment, with opposite or alternate lvs., irregular gamopetalous fls. having 5-lobed corolla-limb, usually 4 stamens, superior 1-celled ovary, and fr. a curved long-beaked caps. Only Proboscidea is grown in N. Amer. for ornament and curiosity, and the frs. for food.

MARVEL-OF-PERU: *Mirabilis Jalapa.*

MASCARENHASIA. *Apocynaceæ.* Shrubs or small trees of Afr. and Madagascar, one planted experimentally as a source of rubber: lvs. opposite: fls. pink or purple, salverform, solitary or clustered: fr. of 2 linear follicles.

elastica. Tall tree: lvs. oblong, to 10 in. long: fls. ½ in. long, in few-fld. cymes: fr. purplish-black, to 3½ in. long. Trop. Afr.

MASDEVALLIA. *Orchidaceæ.* Epiphytic orchids native in trop. Amer., without pseudobulbs and with fls. mostly solitary but sometimes 8 to a stalk, the sepals united and the lobes often prolonged into long tails, the petals small, lip small and united with base of column; see *Orchids* for notes on cult. They require coolhouse treatment, with frequent watering.

bella. Lvs. to 7 in. long: fls. yellow spotted with brown, solitary on stalks to 7 in. high, with tails to 4 in. long, Dec.–June. Colombia.

Chimæra. Lvs. to 1 ft. long: fls. yellow spotted with crimson-purple, on several-fld. stalks, the purple-brown tails to 11 in. long, Nov.–Feb. Colombia.

coriacea. Lvs. to 9 in. long: fls. solitary; sepals violet-rose, white inside spotted with purple, to 1½ in. long; lip white tipped with green and violet at base, May–July. Colombia.

coccinea (*M. Harryana*). Lvs. to 10 in. long: fls. violet-red, the dorsal sepal prolonged into tail; petals white, Mar.–June. Colombia.

Harryana: *M. coccinea.*

Houtteana. Fls. solitary on stalks to 5 in. long, creamy-white spotted with crimson, with long brownish-red tails. Colombia.

ignea: *M. militaris.*

macrura. Lvs. to 1 ft. long: fls. on stalks to 1 ft. long, brownish-yellow spotted with purple, with yellow tails to 10 in. long, Jan.–Mar. Colombia.

militaris (*M. ignea*). Fls. yellow-red, the dorsal sepal prolonged into a long tail, May–June. Colombia.

Reichenbachiana. Lvs. to 6 in. long: fls. on stalks to 8 in. high, dark red outside, rose striped with white outside, with turned-back tails to 3 in. long, May–Aug. Costa Rica.

Schlimii. Lvs. to 7 in. long: fls. 4–7, on stalks to 1 ft. high, yellow spotted with brown inside, the tails yellow, Apr.–May. Venezuela.

tovarensis. Lvs. about 6 in. long: fls. 2–4, on stalks as long as lvs., white with long yellow tails, Nov.–Feb. Venezuela.

Veitchiana. Lvs. to 6 in. long: fls. orange-red shaded with purple, with short tails, May–June. Peru.

MASK-FLOWER: *Alonsoa.*

MASTERWORT: *Astrantia.*

MASTIC-TREE, PERUVIAN: *Schinus Molle.*

MATHIOLA (see p. 8). *Cruciferæ.* Ann. and per., or subshrubs, grayish-pubescent, two in cult. for ornament under the name of stocks, native mostly in Medit. region: lvs. long, entire or sinuate or pinnatifid: fls. lilac, purple, to white, in terminal racemes: fr. long narrow pods or siliques.

bicornis. EVENING STOCK. Ann., low and much branched: lvs. lanceolate or narrower, to 3½ in. long, entire or only small toothed: fls. scattered, lilac or purple, very fragrant at evening and closed by day, about ¾ in. long. S. E. Eu., Asia.

incana. STOCK. BRAMPTON STOCK. GILLIFLOWER. Bien. or per., stiffly erect, to 2½ ft.: lvs. oblong to oblanceolate, to 4 in. long: fls. in terminal racemes, about 1 in. long, purple or reddish varying to white, blush and yellowish, fragrant, often full double. S. Eu., nat. in S. Calif. Var. annua, TEN WEEKS STOCK, is ann. or so grown., blooming earlier. See *Stock.*

MATRICARIA (incl. *Chamomilla*). MATRICARY. *Compositæ.* Annuals, biennials and perennials with finely dissected foliage, often strongly scented, disk-fls. yellow, ray-fls. white or sometimes wanting, the center or receptacle very high or conical; pappus none; native in S. Afr., Medit. region and Orient, a few cult. as ornamentals. The distinctions between Matricaria and Chrysanthemum are technical and are not clear. Matricarias require only the usual treatment for annuals and perennials, indicated under *Chrysanthemum.*

aurea (*Cotula aurea*). Ann., erect, to 12 in.: lvs. finely pinnatisect: heads globular, about ⅜ in. across, dull yellow, on long peduncles. Spain, N. Afr., Caucasus.—Sometimes raised in flower-garden.

capensis: *Chrysanthemum Parthenium.*

Chamomilla. SWEET FALSE CHAMOMILE. Ann. to 2 ft., glabrous, much branched: lvs. 2–3-pinnate into linear segms.: heads 1 in. across, with 10–20 white rays. Eu., N. Asia; escaped in E. U. S.

discoidea: *M. matricarioides.*

eximia: *Chrysanthemum Parthenium.*

grandiflora of hort.: *M. inodora* var. *plenissima.*

inodora (*Chrysanthemum* and *Pyrethrum inodorum*). SCENTLESS FALSE CHAMOMILE. Ann. to 2 ft., diffusely branching, glabrous, scarcely scented: lvs. 2–3-pinnate into linear segms.: heads 1½ in. across, with 20–30 white rays. Eu. Var. plenissima (*M. grandiflora*) has very double heads, sometimes known as "Bridal-Rose."

matricarioides (*M. discoidea*). Ann. to 1½ ft.: lvs. 2–3-pinnate into linear segms.: heads ⅓ in. across, without ray-fls. N. Amer.

parthenoides: *Chrysanthemum Parthenium.*

Tchihatchewii (*Chrysanthemum Tchihatchewii*). TURFING DAISY. Mat-forming per., sending up sts. 6–12 in. high terminated by white-rayed attractive daisy-like heads 1 in. or less across: lvs. finely cut. Asia Minor.

MATRIMONY-VINE: *Lycium.*

MATTEUCCIA: *Pteretis.*

MAURANDIA. *Scrophulariaceæ.* Per. herbs mostly climbing by means of coiling petioles, with axillary showy irregular trumpet-shaped fls. in white, rose, purple and blue, and triangular or halberd-shaped lvs.; Mex. and adjacent U. S.

Maurandias flower freely in winter in a cool greenhouse, but if the seed is sown early they bloom the first summer and may then be used in baskets or vases in the open. For seed sowing, a soil of 4 parts new loam, 2 parts leaf-mold, 1 part sand may be employed; cover with glass and keep at a temperature of 60°. Under glass maurandias may also be propagated from cuttings taken any time after the middle of January.

alba: probably a color form of *M. Barclaiana.*

antirrhiniflora (*Antirrhinum antirriniflorum* and *A. maurandioides*). Plant glabrous: lvs. arrow- or halberd-shaped, to 1¾ in. long: fls. purple or white, to 1 in. long, the sepals lanceolate. Tex., Calif., Mex.; now widely spread.

Barclaiana. Lvs. glabrous, halberd-shaped, entire, about 1 in. long, the petioles long and twining: fls. 1½ in. long, purple-downy outside, the sepals glandular-hairy and long-attenuate. Mex.

erubescens. Plant glandular-hairy: lvs. triangular, toothed, 3 in. and more long: fls. rose-red, 3 in. long, the sepals broad and leafy, to 1 in. long, corolla-lobes obtuse or notched. Mex.—Commonly grown under the name *M. scandens.*

Lophospermum (*Lophospermum scandens*). Often confused with *M. erubescens* but the corolla-tube straight rather than ventricose and glabrous outside, the lobes more acute, the sepals oblong and attentuated. Mex.—Infrequent. Most of the material cult. as *M. scandens* is *M. erubescens.*

purpurea grandiflora: probably a color form of *M. Barclaiana.*

Purpusii. To 2 ft., lopping but not climbing, slightly pubescent, the rootstock tuberous: lvs. arrow-shaped, to 2 in. long, slightly toothed or entire: fls. violet, 2 in. long; sepals broad-ovate, purplish, ½ in. long. Mex.

scandens. Plant glabrous: lvs. arrow-shaped, to 1½ in. long: fls. purple, 1 in. long; sepals lanceolate, about half length of corolla-tube. Mex.—The plant commonly cult. as *M. scandens* is *M. erubescens.*

MAXILLARIA. *Orchidaceæ.* Epiphytes native in trop. Amer., usually with pseudobulbs and small mostly dull-colored sometimes fragrant solitary fls., the lateral sepals united to foot of column and forming a chin, the lip mostly 3-lobed. For cult. see *Orchids.* Grown after the manner of Lycaste.

densa: *Ornithidium densum.*

grandiflora. Fls. to 4 in. across, white, lip lemon-yellow with side lobes streaked with crimson. Peru, Ecuador.

Houtteana. Pseudobulbs with 1 lf. to 7 in. long and ¾ in. wide: fls. about 2 in. across, yellow outside and reddish-brown inside, the lip yellow spotted with purple, Apr.–May. Venezuela.

hyacinthina: *Xylobium hyacinthinum.*

luteo-alba. Pseudobulbs with 1 lf. to 20 in. long and 2 in. wide: fls. large and fragrant; sepals and petals yellow tinged with brown and whitish at base; lip white with purple-marked side lobes and wavy midlobe yellow in center, Apr.–June. Venezuela.

picta. Pseudobulbs with 2 lvs. to 10 in. long: fls. rather large; sepals and petals yellow or yellowish-white spotted with purple; lip white or yellowish-white spotted with red, Jan.–Apr. Brazil, Guiana.

porphyrostele. Pseudobulbs with 2 lvs. to 8 in. long and ½ in. wide: fls. yellow with nearly white lip spotted with red, Feb.–Apr. Brazil.

rufescens. Pseudobulbs with 1 lf. to 6 in. long and 1 in. wide: fls. rather small, yellow tinged and spotted with brown and purple, July, Dec. Mex., W. Indies.

Sanderiana. Pseudobulbs with 1 lf. to 1 ft. long and 2½ in. wide: fls. nodding, 4 in. across; sepals and petals white thickly spotted with purple at base; lip yellow marked with red and dark purple outside, wavy-margined, Aug.–Oct. Peru.

setigera. Pseudobulbs with 1 lf. to 1 ft. long and 2 in. wide: fls. rather large; sepals and petals white tipped with yellow; lip with red-veined side lobes and midlobe yellow in center, June–Aug. Colombia.

tenuifolia. Pseudobulbs with 1 lf. to 1 ft. long and ½ in. or less wide: fls. greenish outside, spotted inside with red-brown, July–Sept. Mex.

variabilis. Pseudobulbs with 1 lf. to 4 in. long and ¾ in. wide: fls. small, deep purple, blooming all year. Mex. to Guatemala.

venusta. Pseudobulbs with 2 lvs. to 8 in. long and 1½ in. wide: fls. 6 in. across, snow-white with yellow lip edged with red, Sept.–Nov. Colombia.

MAXIMILIANEA: *Cochlospermum.*

MAYBERRY: *Rubus palmatus.*

MAYENIA: *Thunbergia erecta.*

MAYFLOWER: *Epigæa repens.*

MAYPOP: *Passiflora incarnata.*

MAYTENUS. *Celastraceæ.* Evergreen trees and shrubs bearing alternate simple leathery lvs., small polygamous fls., and leathery capsular fr.; grown for ornament in warm climates. Propagated by seeds or suckers.

Boaria. Mayten. Tree to 25 ft. and more: lvs. lanceolate, to 2 in. long, finely toothed: fls. greenish, in axillary clusters: seeds with scarlet aril. Chile.

MAZUS. *Scrophulariaceæ.* Low mat-forming herbs grown as ground-cover or in rock-gardens: lvs. toothed or cut: fls. blue or white, short-tubular, 2-lipped, in terminal more or less one-sided racemes; native in Asia, Australia and Malaya. Increased by division or seeds, and of simple requirements.

japonicus (*M. rugosus*). Trailing per., fl.-sts. to 1 ft. high: lvs. obovate, to 2½ in. long, coarsely toothed: fls. to ¾ in. long, blue, the ridges of the lower lip brown-spotted and bearded with club-shaped hairs. E. Asia.

pumilio. Per. with creeping underground sts.: lvs. obovate, to 3 in. long, entire or coarsely toothed: fls. white or bluish with yellow center, to ⅓ in. long. New Zeal., Australia.

rugosus: *M. japonicus.*

MEADOW-BEAUTY: *Rhexia.* -Foam: *Limnanthes Douglasii.* -Rue: *Thalictrum.*

MEADOWSWEET: *Filipendula, Spiræa alba.*

MECONOPSIS. *Papaveraceæ.* Poppy-like herbs with yellow juice, entire, lobed or dissected lvs. and yellow, reddish or blue fls. solitary or in racemes or panicles; grown in the flower- and rock-garden.

The plants are mostly hardy or semi-hardy, but different species may require special treatment. Seed may be sown in the open in spring.

Baileyi: *M. betonicifolia* var.

bella. Stemless per.: lvs. pinnately cut, to 4 in. long: fls. pale blue, to 2 in. across, solitary on scapes to 3 in. high. Himalayas.

betonicifolia (*Cathcartia betonicifolia. M. betonicifolia* var. *Francheti*). To 6 ft.: lvs. ovate to oblong, to 6 in. long, cut-toothed or nearly lobed, glaucous beneath: fls. blue-violet or purple, about 2 in. across, in cymes. China. Var. **Baileyi** (*M. Baileyi*) differs only in having ovary covered with yellowish bristles rather than glabrous.

cambrica. Welch-Poppy. Per. to 1½ ft.: lvs. pinnate, to 6 in. long, glaucous beneath: fls. pale yellow, to 3 in. across, solitary. W. Eu. Var. **flore-pleno** has double fls.

grandis. Per. to 3 ft.: lvs. entire or coarsely toothed, to 7 in. long: fls. brown-purple, to 5 in. across, in 3-fld. cymes. Himalayas.

heterophylla. Flaming-Poppy. Wind-Poppy. Ann. to 2 ft.: lvs. irregularly pinnate, to 6 in. long: fls. brick-red with purple center, to 2 in. across, solitary. W. N. Amer.

integrifolia. Yellow Chinese-Poppy. Bien. to 3 ft.: lvs. linear-lanceolate, entire, to 8 in. long: fls. yellow, to 6 in. across, in 3–7-fld. cymes. Cent. Asia.

nepalensis: *M. paniculata.*

paniculata (*M. nepalensis*). Per. to 5 ft.: lvs. lobed or toothed, rarely pinnately cut, to 1½ ft. long: fls. yellow, 2 in. across, in racemes to 2 ft. long. Cent. Asia.

Prattii. Ann. to 3 ft.: lvs. to 5½ in. long and 1 in. wide, almost entire: fls. bright blue, sometimes tinged with purple, in long racemes. China.

rudis. Ann. to 3 ft.: lvs. oblong-lanceolate, nearly entire, to 4 in. long: fls. blue or pale purple, to 2½ in. across, in raceme-like cymes. Cent. Asia.

simplicifolia. Per. to 2 ft.: lvs. usually entire, to 8 in. long: fls. purple or blue, nodding, to 3 in. across, solitary. Cent. Asia.

sinuata. Ann. or bien. to 2 ft.: lvs. irregularly lobed, to 7 in. long: fls. pale bluish-purple, to 3 in. across, in raceme-like cymes. Cent. Asia. Var. **latifolia** grows to 4 ft. high and has blue fls.

Wallichii. Satin-Poppy. Per. to 6 ft.: lvs. pinnately cut: fls. pale blue, satiny, to 2 in. across, in panicled cymes. Cent. Asia.

MEDEOLA. *Liliaceæ.* One per. herb with tuberous root which is sometimes eaten, native in E. N. Amer. **M. virginiana.** Indian Cucumber-Root. To 2 ft. or more: lvs. in two whorls, to 5 in. long and 2 in. wide: fls. small, greenish-yellow, in a terminal umbel, the perianth-segms. distinct: berries dark purple.

MEDICAGO. Medick. *Leguminosæ.* Herbs or rarely shrubs with lvs. of 3 small lfts., small papilionaceous fls. in short axillary racemes or heads, and curved or spirally twisted pods; one species (*M. sativa*) is extensively grown for hay, and others are sometimes planted for forage or ornament.

Alfalfa should be grown on deep well-drained non-acid soil. Propagated by seeds sown in drills or broadcasted. The annual species grown for ornament and interest require no special handling.

arabica. Spotted Bur Clover. Ann.: fls. yellow: pods compactly coiled, spiny. Eu.; nat. in N. Amer.

arborea. Tree Alfalfa. To 8 ft.: fls. orange-yellow: pods spiral, not spiny. S. Eu.

Echinus. Calvary Clover. Ann.: fls. yellow: pods spiny. S. France.

hispida. Toothed Bur Clover. Ann.: fls. yellow pods loosely coiled, spiny. Eu., Asia; nat. in N. Amer.

intertexta. Ann.: fls. yellow: pods coiled, spiny. Medit. region.

lupulina. Hop Clover or Black M. Ann.: fls.

yellow: pods curved, nearly glabrous. Eu., Asia; nat. in N. Amer.

orbicularis. Ann.: fls. yellow: pods spirally coiled, not spiny, glabrous. S. Eu. to W. Asia.

rigidula. Tifton Bur Clover. Ann., procumbent: fls. yellow: pods coiled, spiny, pubescent. Eu.

sativa. Alfalfa. Lucerne. Per.: fls. purplish: pods loosely spiral, pubescent, not spiny. Eu.; nat. in N. Amer.

scutellata. Snail M. Ann.: fls. yellow: pods resembling a snail shell, not spiny. Eu.

MEDICK: *Medicago.*

MEDINILLA. *Melastomaceæ.* Trop. Old World shrubs with simple entire lvs., white or rose fls. in panicles or cymes, and fr. a berry crowned by the calyx-lobes; grown in hothouses.

The plants should be given plenty of light but shaded from the direct rays of the sun. Propagated by cuttings potted singly in a mixture of finely sifted peat and sand, kept close and fairly moist.

amabilis: *M. Teysmanni.*

magnifica. Striking evergreen when in bloom, with angled or winged sts.: lvs. ovate or ovate-oblong, sessile, to 1 ft. long: fls. coral-red, 1 in. across, in pendulous panicles to 1 ft. long and with great showy pinkish bracts. Philippines.—A striking plant, once frequent in greenhouses.

Teysmanni (*M. amabilis*). Sts. 4-winged: lvs. oblong, sessile, to 1 ft. long: fls. rose, to 2 in. across, in erect panicles without bracts. Celebes, New Guinea.

MEDIOCACTUS. *Cactaceæ.* Mostly or often epiphytic, with long procumbent usually 3-winged branches that bear aerial roots: fls. nocturnal, large, funnelform, the tube scaly: 2 species, S. Amer. See *Cacti.*

coccineus (*Cereus coccineus. C. setaceus*). Usually climbing on trees or clambering over rocks, joints to 3 in. broad, spines commonly 2 or 3 or only 1, pinkish then brown or yellowish: fls. white, outer segms. green, to 1 ft. long. Brazil, Argentina.

MEDLAR: *Mespilus germanica.*

MEGACLINIUM: *Bulbophyllum falcatum.*

MEGAPTERIUM: *Œnothera.*

MEGASEA: *Bergenia.*

MEGOTIGEA: *Helicodiceros.*

MEIBOMIA: *Desmodium.*

MELALEUCA. Bottle-Brush. *Myrtaceæ.* Shrubs and trees native in Australia, freely planted in Calif., with mostly alternate simple lvs., red, white or yellow fls. in spikes or heads, the long-exserted stamens making the infl. resemble a bottle-brush, and capsular frs. For cult. see *Callistemon*, from which Melaleuca differs in having the stamens united in bundles opposite the petals.

acuminata. Lvs. mostly opposite, lanceolate, to ⅓ in. long, often pungent-pointed: fls. whitish, in lateral clusters.

alba: *M. armillaris.*

armillaris (*M. alba*). To 30 ft.: lvs. to ¾ in. long and 1/16 in. or less wide: fls. white, the spikes to 2 in. long.

decussata. To 20 ft.: lvs. opposite, to ½ in. long and ⅛ in. wide: fls. lilac, the spikes to 1 in. long.

elliptica. Lvs. opposite, oval, to ½ in. long, somewhat glaucous: fls. red, in spikes to 3 in. long.

ericifolia. Shrub or tree: lvs. narrowly linear, ½ in. or less long: fls. yellowish-white, the spikes to 1 in. long.

genistifolia. To 40 ft.: lvs. linear-lanceolate or lanceolate, flat, to ½ in. long, stiff: fls. white.

Huegelii. To 6 ft.: lvs. ovate or ovate-lanceolate, to ¼ in. long, spirally overlapping: fls. white, the spikes to 5 in. long.

hypericifolia. Tall shrub: lvs. mostly opposite, to 1½ in. long and ¼ in. wide: fls. rich red, the dense spikes 2–3 in. long.

incana. Tall shrub: lvs. linear or lanceolate, to ½ in. long, crowded and spreading, usually hoary: fls. yellowish-white.

lateritia. Tall shrub: lvs. linear, to ¾ in. long: fls. scarlet, in spikes to 3 in. long.

Leucadendra. Cajeput-Tree. Punk-Tree. Tree, bark shredding in broad strips: lvs. to 4 in. long and ¾ in. wide: fls. creamy-white, the spikes to 6 in. long. Name commonly spelled *Leucadendron.* A conspicuous tree.

linariifolia. Tall tree: lvs. mostly opposite, to 1¼ in. long and ⅛ in. wide: fls. white, the spikes to 1½ in. long.

longicoma. Tall shrub: lvs. oblong-lanceolate, to 2 in. long: fls. rich red, in spikes to 2 in. long.

micromeria. Tall shrub: lvs. scale-like and overlapping, 1/24 in. long: fls. small, diœcious, in globular heads.

microphylla. Shrub: lvs. linear, to ¼ in. long: fls. white.

nesophila. To 8 ft.: lvs. to 1 in. long and ¼ in. wide: fls. pink or rose, in dense heads.

nodosa. Shrub or small tree: lvs. linear, to 1 in. long, stiff and spiny-pointed: fls. pale yellow, in small heads.

parviflora (*M. Preissiana*). Tall shrub or tree: lvs. lanceolate, to ½ in. long: fls. white or yellowish, the spikes to 2 in. long.

Preissiana: *M. parviflora.*

radula. Tall shrub: lvs. opposite, linear, to 2 in. long, the margins rolled in: fls. pink or white, in distant pairs.

rhaphiophylla. To 50 ft.: lvs. narrow-linear, to 1 in. long, mostly cylindrical: fls. yellowish-white.

styphelioides. To 80 ft.: lvs. ovate, to ¾ in. long and ¼ in. wide, sometimes twisted: fls. creamy-white, the spikes to 2 in. long.

tenella. To 4 ft.: lvs. narrow-linear, to ¼ in. long, scattered or in 3's: fls. white, small.

teretifolia. Tall shrub: lvs. linear, to 2 in. long, cylindrical: fls. white, in sessile heads.

thymifolia. To 2 ft.: lvs. mostly opposite, lanceolate to linear, to ½ in. long, stiff: fls. red.

Wilsoni. Tall shrub: lvs. opposite, linear, to ½ in. long: fls. red.

MELAMPODIUM. *Compositæ.* American herbs or shrubs with opposite lvs. and heads of ray- and disk-fls.; pappus none; one species is sometimes transplanted to the rock-garden.

leucanthum. Per. to 1 ft., hairy: lvs. linear to spatulate, to 2 in. long, mostly entire: heads to ¾ in. across, rays white. Kans. to Colo. and Tex.

MELANTHIUM. Bunch-Flower. *Liliaceæ.* Per. herbs with stout rootstocks, mostly basal lvs. and monœcious or polygamous, greenish or white fls. borne in large terminal panicles, the perianth-segms. distinct; sometimes transplanted to the wild- or bog-garden.

virginicum. To 5 ft.: lvs. linear, to 1 ft. long: fls. greenish-yellow, ⅓ in. across, in long panicles to 1½ ft. long, June–Aug. R. I. to Fla. and Tex.

MELASPHÆRULA. *Iridaceæ.* One S. African cormous herb, grown like ixias. **M. graminea.** To 2 ft.: lvs. in basal rosette, to 1 ft. long and ½ in. wide: fls. yellowish-green veined with purplish-black, ½ in. long, in loose panicles, the perianth-tube very short.

MELASTOMA. *Melastomaceæ.* Old World or Pacific trop. shrubs with opposite entire lvs., purple, rose or white fls. solitary or clustered at ends of branches, and fr. a berry. Grown in the greenhouse or out-of-doors in warm regions. Propagated by cuttings in spring over bottom-heat.

malabathricum. To 8 ft.: lvs. to 2½ in. long and 1¼ in. wide, hairy: fls. mauve-purple, 2 in. across. India.

Molkenboerii. To 20 ft.: lvs. about 4 in. long and 1½ in. wide, pubescent: fls. mauve, about 2 in. across. Java. Var. **album** has white fls.

MELASTOMACEÆ. Melastoma Family. Mostly trop. herbs, shrubs and trees in both hemispheres, of about 175 genera, with simple opposite or whorled lvs., commonly with 3–9 strong longitudinally parallel nerves, bisexual regular polypetalous fls. having 4–5-lobed calyx, 4–5 petals, as many or twice as many stamens that are prevailingly unequal and declined or bent, inferior 2–many-celled ovary, and fr. a berry or caps. The following genera are grown for ornament, mostly in greenhouses: Bertolonia, Centradenia, Heterocentron, Medinilla, Melastoma, Miconia, Phyllagathis, Rhexia, Schizocentron, Sonerila, Tibouchina, Tococa.

MELIA. Bead-Tree. *Meliaceæ.* Trees or shrubs with pinnate lvs., white or purple fls. in axillary panicles, and fr. a small somewhat fleshy drupe; native in trop. Asia and Australia; one species widely cult. in warm regions and withstands several degrees of frost. Propagated by seeds sown as soon as ripe, and by cuttings under glass.

Azadirachta. Margosa. Evergreen tree to 50 ft. with 1-pinnate lvs. near ends of branches, small white fls., and oblong frs. to ¾ in. long, from India, may occur far southward.—It is better retained in a separate genus, as *Azadirachta indica.*

Azedarach (*M. sempervirens*). China-Berry. China-Tree. Pride-of-India. Indian Lilac. Spreading mostly deciduous tree to 50 ft.: lvs. 2-pinnate, the lfts. toothed or lobed: fls. purplish, fragrant: frs. globose, yellow, to ¾ in. across, hanging after lvs. fall. Asia; nat. in trop. Amer. and planted in warm-temp. and trop. regions around the world; sometimes run wild. Var. **umbraculiformis,** Texas Umbrella-Tree, has drooping foliage and radiating branches which give an umbrella-like effect. Var. **floribunda** is a bushy very floriferous form; *M. semperflorens* is probably the same.

sempervirens: *M. Azedarach.*

MELIACEÆ. Mahogany Family. Trees and shrubs, or seldom woody herbs, of about 40 genera largely in trop. regions, with usually alternate pinnate or digitate lvs., commonly bisexual polypetalous fls. in panicles, the sepals and petals 4 or 5, mostly 8–10 stamens, 2–5-celled ovary, and fr. a caps. or drupe or berry. The genera known to hort. are Cedrela, Dysoxylum, Melia, Swietenia, Trichilia, Turræa. With the exception of Melia, the species are little grown within the U. S., but the mahoganies (Swietenia) are always of interest.

MELIANTHACEÆ. Melianthus Family. Three genera of African trees or shrubs with alternate often large and showy lvs., bisexual mostly striking polypetalous fls. in racemes having 4–5 sepals and petals, 4, 5 or 10 stamens, superior 4–5-celled ovary, the essential organs often prominently protruded, and capsular not prominent fr. Greyia and Melianthus are grown for ornament.

MELIANTHUS. Honey-Bush. *Melianthaceæ.* S. African evergreen shrubs, often with herb-like sts., bearing alternate pinnate lvs. and large stipules, very irregular showy nectar-bearing fls. in racemes, 4 exserted stamens, and fr. an inflated caps.; planted in warm regions for decorative purposes.

The plants are very strong-scented and in Africa are valued for medicine. They do well in southern California. Propagated by seeds and cuttings in heat.

comosus. Lvs. to 6 in. long, the lfts. lanceolate and toothed, white-tomentose beneath, with winged petiole and 2 stipules about ½ in. long: fls. orange spotted with red, green at base, in nodding racemes to 3 in. long.

major. To 10 ft.: lvs. 1 ft. or more long, of 9–11 toothed lfts., with winged petiole and stipules united into one piece 2 in. long: fls. red-brown, about 1 in. long, in racemes 1 ft. long.

minor. Lvs. to 6 in. long, the lfts. lanceolate, with 2 free stipules: fls. dull red, in erect racemes to 1½ft. long.

MELICA. Melic-Grass. *Gramineæ.* Per. grasses with flat lvs. and spikelets borne in narrow or open panicles; native in temp. regions and sometimes cult. for ornament. See *Grasses.*

altissima. To 4 ft., with creeping rhizomes: lvs. flat, to 1 in. broad: panicles to 8 in. long, narrow, loose and interrupted. S. Eu.

ciliata. Tufted, to 3 ft., with creeping rhizomes: lvs. mostly narrow and involute: panicles to 8 in. long, spike-like, the spikelets silky. Eu.

MELICOCCA (*Melicoccus*). *Sapindaceæ.* Two trop. American trees, one of which is grown in warm regions for its edible frs. **M. bijuga.** Mamoncillo. Spanish-Lime. Genip. To 60 ft.: lvs. of 4 elliptic-lanceolate lfts. to 4 in. long: fls. small, greenish-white, fragrant, polygamous or diœcious, in racemes to 4 in. long borne in terminal panicles: fr. round, 1 in. or more across, the large stone surrounded by yellowish juicy edible pulp.—When well established will stand several degrees of frost. Propagated by seeds.

MELICYTUS. *Violaceæ.* Diœcious trees and shrubs native from New Zeal. to Fiji Isls.: lvs. alternate: fls. small, in clusters: fr. a berry. One species is sometimes planted in Calif.

ramiflorus. To 30 ft., bark white: lvs. oblong-lanceolate, to 5 in. long, toothed: fls. greenish, ⅛ in. across: berries blue, ⅙ in. across.

MELILOTUS. Melilot. Sweet Clover. *Leguminosæ.* Ann. and bien. herbs, sweet-smelling, with trifoliolate lvs., small papilionaceous fls. in slender axillary and terminal racemes, and short straight very small pods; grown as bee-plants, forage and green-manure crops, and also nat. Propagated by seeds.

alba. White S. Bokhara Clover. Bien. to 10 ft.: fls. white. Eu., Asia; nat. in N. Amer. Var. **annua,** Hubam Clover, matures in one year.

cærulea: *Trigonella cærulea.*

gracilis. Ann. to 4 ft.: fls. yellow. S. Eu.

indica. To 3 ft.: fls. yellow. Eu., Asia; nat. in N. Amer.; cover-crop in Calif.

officinalis. Yellow M. To 8 ft.: fls. yellow, larger than in *M. indica.* Eu., Asia; nat. in N. Amer.

MELIOSMA. *Sabiaceæ.* Trop. trees or shrubs, evergreen or deciduous, bearing alternate simple or pinnate lvs., small not showy fls. in panicles, and fr. a small drupe; grown in Calif. Propagated by seeds, layers, and cuttings of young wood under glass.

cuneifolia. To 20 ft.: lvs. obovate, to 7 in. long, wavy-toothed: fls. yellowish-white, fragrant, in panicles to 10 in. long, in July: fr. black, about ¼ in. diam. China.

MELISSA. Balm. *Labiatæ.* Erect herbaceous perennials, with broad toothed lvs. and white or yellowish 2-lipped fls. in axillary clusters; only one cult. for the lemon-flavored lvs. used in seasoning, especially in liquers, and also as a medicine; one of the sweet herbs. Propagated by seeds sown in a hotbed or coldframe, also by division.

officinalis. Lemon B. Bee B. Aromatic, to 2 ft.: lvs. ovate, to 3 in. long: fls. white, ½ in. long, in late summer. Eu., Asia; nat. in N. Amer. Var. **variegata** is sometimes used in borders.

MELITTIS. *Labiatæ.* One per. herb to 1½ ft., native in Cent. and S. Eu. and W. Asia, and sometimes planted in the open. **M. Melissophyllum.** Lvs. cordate-ovate, toothed: fls. pink and variegated, 2-lipped, to 2 in. long, in axillary whorls.

MELOCACTUS (*Cactus*). *Cactaceæ.* As now defined (particularly under the genus Cactus, a name rejected by the International Rules), a group of some 18 small species: plant-body solitary or clustered, globular to short-cylindric or even depressed, ribs 9–20 and bearing clusters of spines: fls. small, pinkish, opening in mid-afternoon, close together in a terminal hairy and bristly mass or cephalium. See *Cacti.*

Besleri: *Discocactus placentiformis.*

communis (*Cactus Melocactus*). Turks-Head or Turks-Cap Cactus. Body short-cylindric, to 12 in. and more, with 10 or 11 ribs and awl-like spreading radial spines: fls. to 1½ in. long, red. Jamaica.

intortus (*Cactus intortus*). Body globose to cylindric and 3 ft. or more tall with a long woolly head, ribs 14–20, and 10–15 yellow or brown stout spines to nearly 3 in. long: fls. about ¾ in. long, pinkish. W. Indies.—Known under many names.

macrocanthos (*Cactus macrocanthos*). Globular or perhaps broader than high, sometimes 1 ft. diam., the cephalium becoming 8 or 9 in. high, the radial or outer spines needle-like, appressed, and unlike the stouter awl-like central ones: fls. about ¾ in. long. Curacao and adjacent isls. of the southern Caribbean Sea.—Known under a great number of names.

missouriensis: *Neobesseya missouriensis.*

MELON, MUSKMELON (*Cucumis Melo* and varieties); not including the watermelon (which see), which is a very different fruit. The melons commonly known in this country are of two types or groups,—the netted or nutmeg melons, and the cassaba or winter melon. The culture of the two is similar except that the cassaba requires a longer season and is not grown to any extent in the northern and central melon regions. The cantaloupe is a form of melon seldom grown in North America and practically unknown among the people, although the name is commonly but inaccurately applied to varieties of the netted melon class.

All the melons are alike in requiring open fertile soil and sunny location, continuous rapid growth, and all are frost-tender. They are readily grown in the home garden, but the commercial supply comes from special regions although such regions are likely to shift or the melons to "run out" in a few years probably due to insects and diseases and perhaps to changed soil conditions. The plants may be started directly in the field in hills about 4 by 6 feet apart, or under glass on inverted sods or in pots and boxes. The hills or stands should be made fertile by the addition of well-rotted manure and perhaps chemical fertilizer if the land is not in good heart. Two to four strong plants are left in each hill after the losses inflicted by bugs and accidents. Shallow clean tillage should be practised until the plants begin to run. Three or four good fruits is a good yield to the vine.

The striped cucumber beetle is likely to be troublesome: plant liberally to allow for losses, cover young plants with mosquito-netting in the home garden, or apply various repellents now on the market.

In the cooler parts of the country home melons are frequently grown permanently in frames, and an assured crop of excellent quality should be obtained. A spent hotbed, that has been used for lettuce or other early crop, provides excellent quarters.

The melon is an interesting crop to grow regularly under glass, but if ripened to full quality in midwinter much heat and constant care are required. There are special forcing or winter melons of the English type that yield fruits of particular excellence and beauty. Whether grown for late autumn crop or for spring or for midwinter, the plants are raised preferably on benches to insure sufficient bottom heat. The plants may be set about 2½ feet apart (having been started in pots) on 4-foot benches, and trained high so that the fruits hang; but the fruits must be suspended in netting, raffia slings or other support. Pollination is performed by hand. The air should be kept on the dry side at ripening time. About four months is required from seed-sowing to midwinter fruit in northern climates, depending much on soil, season, adaptability of the house, skill of the grower, and variety of melon. For early November crop, seeds may be started by the middle of July of the regular forcing melons.

MELON, PRESERVING: *Benincasa hispida, Citrullus vulgaris* var. *citrioides.*

MELOTHRIA. *Cucurbitaceæ.* Very slender climbing or prostrate monœcious or diœcious herbaceous vines in the warm parts of both hemispheres, about 70 species, a few native in the U. S.: lvs. entire or lobed: fls. small and not conspicuous, pistillate solitary or clustered, staminate racemose or corymbose: fr. small, berry-like, smooth or warty. Two species are somewhat grown for ornament.

punctata (*Pilogyne suavis*). Per. from a thick root: lvs. cordate-ovate, angled or lightly 3–5-lobed: fr. about ¼ in. diam., slightly pitted, brown. Afr.—Raised from seeds; the roots may be brought in for the winter, the tops cut back and grown in window-gardens, or they may be stored till spring.

scabra. Ann. or grown as such: lvs. triangular-ovate and lobed: fr. to 1 in. long, glabrous and more or less spotted with green. Mex.—Blooms in latter part of summer from seeds sown in Apr.

MENISPERMACEÆ. MOONSEED FAMILY. Woody or herbaceous plants, largely twining vines, of 63 genera mostly in the tropics, having alternate simple but sometimes lobed lvs., small inconspicuous diœcious polypetalous fls. with usually 6 sepals and 6 petals, 6 or more stamens, 3 or more separate carpels, and fr. a drupe. A few genera are grown for ornament over arbors or walls, as Cocculus, Menispermum, Sinomenium, the foliage being the chief consideration, although the berries may be attractive.

MENISPERMUM. MOONSEED. *Menispermaceæ*. Two woody twining vines with peltate lvs. and white or yellowish fls. in racemes or panicles, suitable for outdoor cult. in the N. for trellises and arbors; the foliage is attractive. Propagated by seeds or cuttings of ripe wood.

canadense. Lvs. broad-ovate, to 8 in. long, entire or shallowly lobed, pubescent beneath when young: fr. black. Que. to Ga. and Ark.

dauricum. Resembles the above, but the lvs. are smaller, more distinctly peltate, and glaucous and glabrous beneath. E. Asia.

MENODORA. *Oleaceæ*. Subshrubs with opposite simple or pinnate lvs. and yellow or white fls. in terminal racemes or cymes or solitary; native in N. and S. Amer. and S. Afr. and one species intro. to cult. in Calif.

integrifolia. To 2 ft.: lvs. lanceolate or linear-lanceolate, to 1 in. long, entire, margins recurved: fls. ½ in. long, bell-shaped, in terminal cymes. Brazil, Argentina.

MENTHA. MINT. *Labiatæ*. Herbs mostly cult. for the aromatic oil obtained from all parts of the plant, a few in the garden; well-known sweet-herbs: sts. square: lvs. simple: fls. small, purplish, pink or white, crowded in axillary clusters in terminal spikes or heads.

Mints are easily propagated by cuttings and division, in some cases by stolons or runners; also by seeds when available. They tend to become established and to run wild.

aquatica. WATER M. Per. to 2½ ft., hairy: lvs. ovate, to 3 in. long, toothed: fls. in dense terminal spikes to 1 in. long, and in the upper axils. Eu.; nat. in E. U. S.

arvensis. Per. of wide distribution over the world, in several forms or subspecies, producing runners: to 2 ft.: lvs. oblong to ovate, 1–2 in. long, more or less pubescent or hairy, rounded at base. Eurasia, N. Amer. Var. **canadensis** (*M. canadensis*). Lvs. narrower, tapering at base. Me. to Calif. Var. **piperascens**. JAPANESE M. Plant larger, to 3 ft., lvs. larger; an oil-producing plant.

austriaca: *M. sylvestris*.

canadensis: *M. arvensis* var.

Cardiaca. Per. to 2 ft. and more, with ascending upper branches, more or less pubescent: lvs. lanceolate to oblong, sharp-serrate: infl. interrupted or in detached leafy whorls and thus differing from *M. spicata*, with which it has been confused in cult. Eu.: nat. in N. Amer.

citrata. BERGAMOT M. Per. by leafy stolons, st. decumbent, to 2 ft. long, glabrous: lvs. ovate, to 2 in. long, toothed: fls. in the uppermost axils and in dense terminal spikes to 1 in. long. Eu.; nat. in N. Amer.

crispa. Per., with weak hairy sts. to 3 ft. long: lvs. ovate, crisped and sharp-toothed: fls. in terminal spikes to 1½ in. long. Eu.; nat. Conn. to Pa.

gentilis of hort.: *M. spicata*.

gibraltarica: *M. Pulegium* var.

piperita. PEPPERMINT. Per. by runners and root-stocks, having strong pungent or pepper-like oil, to 3 ft.: lvs. lanceolate, to 3 in. long, toothed: fls. in thick terminal spikes to 3 in. long, purple seldom white. Eu. Var. **vulgaris**, BLACK M., has purple sts. and dark foliage.

Pulegium. PENNYROYAL. Prostrate: lvs. oval, ½ in. long, entire: fls. in dense axillary whorls, bluish-lilac. Eu., W. Asia. Var. **gibraltarica** has deep green sometimes variegated lvs.

Requieni. Small creeping herb, used for ground-cover: lvs. round, very small: fls. mauve or pale purple, in loose few-fld. whorls. Corsica.

rotundifolia. APPLE M. Per. by leafy stolons, to 30 in., pubescent: lvs. sessile, oval, to 2 in. long, toothed: fls. purple, in dense or interrupted spikes to 4 in. long. Eu.; nat. in N. Amer. Var. **variegata** has variegated lvs.

spicata (*M. gentilis*, Hort. *M. viridis* of trade lists). SPEARMINT. Per. by leafy stolons, to 2 ft., glabrous: lvs. sessile, lanceolate, to 2½ in. long, toothed: fl.-whorls in narrow not leafy spikes to 4 in. long. Eu.; nat. in N. Amer.

sylvestris (*M. austriaca*). Lvs. sessile, lanceolate, toothed, white-tomentose beneath: fls. purplish, pubescent, in dense spikes or interrupted at base. Eu., Asia.

viridis of hort.: *M. spicata*.

MENTZELIA. *Loasaceæ*. American herbs or shrubs armed with barbed hairs, often with shredding bark, having mostly alternate lvs., white or yellow often very showy fls., and capsular frs.; cult. in the flower-garden. Propagated by seeds sown where the plants are to grow.

aurea: *M. Lindleyi*.

decapetala (*M. ornata*. *Nuttallia decapetala*). Bien. to 4 ft.: lvs. pinnately lobed: fls. white or yellowish, to 5 in. across, opening in evening, fragrant; petals 10. S. D. to Tex.

lævicaulis. BLAZING STAR. Bien. to 3½ ft., sts. shining white: lvs. wavy-toothed: fls. light yellow, to 4 in. across. Wyo. to Calif.

Lindleyi (*Bartonia aurea*). Ann. to 4 ft.: lvs. pinnately cut or toothed: fls. golden-yellow, to 2½ in. across, opening in evening, fragrant; petals 5. Calif.

ornata: *M. decapetala*.

MENYANTHES. *Gentianaceæ*; by some authors separated in the family *Menyanthaceæ*. A per. herb with creeping rootstocks, native around the world in the cooler parts of the northern hemisphere in wet places and shallow water, sometimes planted in bog-gardens. **M. trifoliata**. BOGBEAN. BUCKBEAN. Lvs. of 3 oblong or obovate entire lfts. with petioles to 10 in. long sheathing at base: fls. white or purplish bearded inside with white hairs, ½ in. long, in 10–20-fld. racemes borne at the end of long scapes.

MENZIESIA. *Ericaceæ*. Low deciduous shrubs with alternate entire lvs., bell-shaped or urn-shaped fls. in terminal clusters, and capsular frs.; suitable for rock-gardens. For cult. see *Andromeda*.

ciliicalyx. Lvs. ciliate, elliptic: fls. yellowish-green tipped with purple, ½ in. long; stamens pubescent.

Japan. Var. multiflora (*M. multiflora*) has 6–10-fld. clusters.

ferruginea. To 8 ft., often straggling: lvs. glandular-ciliate, with rusty hairs above, to 2½ in. long: fls. greenish-purple, ½ in. long; stamens pubescent. Alaska to Calif.

globularis: *M. pilosa.*

multiflora: *M. ciliicalyx* var.

pentandra. Lvs. ciliate, to 1¾ in. long: fls. whitish, ¼ in. long; stamens glabrous. Japan.

pilosa (*M. globularis*). To 6 ft.: lvs. ciliate, hairy, to 2 in. long: fls. yellowish-white or pinkish, ¼ in. long; stamens glabrous. Pa. to Ga. and Ala.

polifolia: *Daboëcia cantabrica.*

MERATIA. *Calycanthaceæ.* Two Chinese shrubs with opposite entire lvs., yellow fls. long before the lvs., and fr. contracted at the mouth. Requires winter protection in the N. Propagated by seeds sown in spring and by layering in autumn.

præcox (*Calycanthus præcox. Chimonanthus fragrans*). To 10 ft., deciduous: lvs. elliptic-ovate to oblong-lanceolate, 6 in. long: fls. fragrant, about 1 in. across, the inner sepals striped with purplish-brown. Var. **grandiflora** has larger lvs. and fls.

MERCURIALIS. *Euphorbiaceæ.* Herbs or subshrubs native in Medit. region, one of which is sometimes grown for medicinal purposes, having opposite simple lvs., diœcious fls. without petals, and capsular frs.

annua. Herb Mercury. Ann. to 2 ft.: lvs. ovate to lanceolate, toothed: male fls. in spikes, female clustered in axils. Eu., Afr.; nat. in N. Amer.

MERCURY ("Markery"): *Chenopodium Bonus-Henricus.* Herb: *Mercurialis annua.*

MERIANA: *Watsonia.*

MERIDIANA: *Gazania.*

MERIOLIX: *Œnothera.*

MERTENSIA. Bluebells. *Boraginaceæ.* Attractive per. herbs, smooth or pubescent, often glaucous, with alternate entire often punctate lvs. and blue, purplish or white erect or drooping fls. in racemes or panicles; corolla funnelform, sometimes crested in the throat; a few species are planted in wild- or rock-gardens; native in northern hemisphere, largely in woods and thickets. Propagated by seeds sown as soon as ripe and with difficulty by division.

Bakeri. To 1 ft.: lvs. spatulate to lanceolate, grayish-pubescent: fls. ½ in. long. Mts. of Colo.

ciliata. To 2 ft., pale and glaucescent: lvs. oval to lanceolate: fls. bright blue, ½ in. or more long. Rocky Mts.

echioides. To 1 ft., soft-hairy: lvs. oblong: fls. deep blue, ⅓ in. long. Himalayas.

lanceolata. To 1 ft., glabrous: lvs. oblong or lanceolate: fls. blue, ¼–½ in. long. Sask. to Colo.

paniculata. To 3 ft., rough-pubescent: lvs. ovate: fls. purple-blue, ½ in. long. N. N. Amer.

pratensis. To 3 ft.: lvs. oval-lanceolate, hairy above: fls. blue varying to white, ⅔ in. long. Colo. to Ariz.

primuloides. To 3 in., rough-hairy: lvs. oval, to ⅓ in. long: fls. deep blue varying to white and yellow, ¼ in. across. Himalayas.

sibrica (*Lithospermum sibiricum*). To 5 ft., glabrous: lvs. ovate: fls. purplish-blue varying to white, ¼–½ long. Siberia.

virginica. Virginia-Bluebells or Cowslip. To 2 ft., glabrous: lvs. elliptic to oblong: fls. with purple tube and blue bell, 1 in. long, the clusters somewhat nodding. N. Y. to Tenn. Var. **rubra** has pink fls.

MERYTA. *Araliaceæ.* Small diœcious trees, one of which may be grown in Calif.: lvs. alternate or crowded at ends of branches, leathery: fls. in panicles or heads: fr. a drupe: native in Pacific Isls., New Zeal., Australia.

Sinclairii. Puka. To 25 ft., evergreen, making a dense head: lvs. oblong, to 2 ft. long, on stalks to 1 ft. or more long, entire, shining: fls. greenish-white, in panicles to 1½ ft. long: fr. black and shining, ½ in. long. New Zeal.

MESEMBRYANTHEMUM. Fig-Marigold. *Aizoaceæ.* More than 1,000 species have been described under this genus, mostly from S. Afr. In recent years the group has been re-studied and special attention has been given to fruit characters, which were mostly overlooked or unavailable in former descriptions. Such marked differences exist that the plants can be best defined and understood by making separate genera, placing closely related kinds together. The new genera that contain the species known to be in cult. in N. Amer. are indicated in the cross-references in this article. The systematic studies of the group are still in progress and further changes in nomenclature are likely to occur.

The plant-forms in the general group are of great variety and absorbing interest to the naturalist. Most of those in cultivation in North America are branching plants with leaves of more or less usual form, but other species have a very condensed structure some of them so closely simulating stones as to be overlooked in their native places, as in Pleiospilos. As a whole, the Mesembryanthemum relatives have the grotesqueness of xerophytic vegetation. The herbage of many of them is provided with glistening points, pimples or vescicles that gives them the name of "ice-plants." In botanical collections under glass the odd forms are sometimes grown as curiosities, but these kinds are little known to the general cultivator; they are likely to be grown by fanciers of cacti and similar plants.

The cultivation of all the genera is conditioned on the fact that the plants are native in hot or semi-arid regions. Some of them grow in barren rocky places and others on sandy plains. A few of them frequent sea-coasts. They are succulent plants, and are therefore able to withstand heat and dryness. If grown in pots, care should be taken to have them properly drained, and the plants should be given full sun when well established. None of them can be carried over winter in the open in the North, but may be placed in a cool dry greenhouse with good ventilation. The stemless condensed species should be watered on top with caution, the better plan being to stand the pots in water or moist ground until the soil is moistened. In climates like Florida and southern California, many of them do well as open-air subjects, particularly in the latter state where the dryness suits them. The perennial species are propagated by cuttings as well as by seeds. The common ice-plant, *Cryophytum crystallinum*, which is an annual, comes quickly from seeds, as does also the showy *Dorotheanthus gramineus* (formerly known as *M. lineare*, *M. pyropœum* and *M. tricolor*), and *Carpanthea pomeridiana*. In window-gardens the commonest species are the ice-plant and *Aptenia cordifolia*. In California the plants most commonly seen in open ground are of the genera Carpobrotus, Cryophytum, Delosperma, Drosanthemum, Lampranthus.

A relatively small number of South African species is now retained in the genus Mesembryanthemum, and few of them are grown in North America. This genus is now defined to include mostly branching plants with 2 or more pairs of distinct leaves and prominent internodes, calyx lobed down to the ovary, petals nearly or quite free to the base, stamens collected into a column or cone, stigmas and cells of ovary normally 5 or 6; these marks distinguish the genus as characterized by Linnæus in combination with the species named by him.

acinaciforme: *Carpobrotus acinaciformis.*

æquilaterale, æquilaterus: see *Carpobrotus chilensis.*

agninum. St. very short and branched: lvs. oblong, to 2 in. long and ½ in. broad, canescent, wrinkled, dotted and with pustule at base, entire or toothed: fls. solitary, yellow, 1 in. across, with many linear petals.—This plant is now separated as *Stomatium agninum.*

Aitonis: *Cryophytum Aitonis.*

aloides: *Nananthus aloides.*

angulatum: *Cryophytum Aitonis.*

aurantiacum: *Lampranthus glaucoides.*

aureum: *Lampranthus aureus.*

australe: *Disphyma australe.*

barbatum: *Trichodiadema barbatum.*

blandum: *Lampranthus multiradiatus.*

Bolusii: *Pleiospilos Bolusii.*

Brownii: *Lampranthus Brownii.*

candens: *Drosanthemum candens.*

caulescens: *Oscularia caulescens.*

chilense: *Carpobrotus chilensis.*

clavellatum: see *Disphyma australe.*

coccineum: *Lampranthus coccineus.*

cordifolium: *Aptenia cordifolia.*

crystallinum: *Cryophytum crystallinum.*

curviflorum: *Lampranthus multiradiatus.*

deltoides. Per., erect or nearly so: lvs. triangular, incurved, to ½ in. long and more than half as broad, glaucous and toothed: fls. rose, ½ in. across.

dolabriforme: *Hereroa dolabriformis.*

echinatum: *Delosperma echinatum.*

Ecklonis: *Delosperma Ecklonis.*

edule: *Carpobrotus edulis.*

elongatum: *Conicosia elongata.*

emarginatum: *Lampranthus emarginatus.*

falciforme: *Lampranthus falciformis.*

filicaule: *Lampranthus filicaulis.*

floribundum: *Drosanthemum floribundum.*

glaucescens: *Carpobrotus glaucescens.*

glaucoides: *Lampranthus glaucoides.*

glaucum: *Lampranthus glaucus.*

glomeratum: *Lampranthus glomeratus.*

Haworthii: *Lampranthus Haworthii.*

heteropetalum: *Erepsia heteropetala.*

inclaudens: *Erepsia inclaudens.*

lacerum: *Semmanthe lacera.*

læve: *Malephora Thunbergii.*

lanceolatum: *Cryophytum Aitonis.*

lineare: *Dorotheanthus gramineus.*

linguiforme: *Glottiphyllum linguiforme.*

longum: *Glottiphyllum longum.*

maximum Per., woody, erect: lvs. large, crowded, half-moon-shaped, 3-angled but flattened, clasping, obtuse, glaucous, dotted: fls. small, reddish.

multiceps: *Bergeranthus multiceps.*

multiflorum. Per., woody, erect, to 3 ft., with straight branches: lvs. separated, long-linear, somewhat 3-angled, glaucous-green, to 3 in. long: fls. white.

multiradiatum: *Lampranthus multiradiatus.*

muscipulum: listed name.

mutabile: *Erepsia mutabilis.*

nodiflorum: *Cryophytum nodiflorum.*

pomeridianum: *Carpanthea pomeridiana.*

pugioniforme: *Conicosia pugioniformis.*

pustulatum: *Glottiphyllum longum.*

pyropæum: *Dorotheanthus gramineus.*

rhomboideum: *Rhombophyllum rhomboideum.*

rhopalophyllum: *Fenestraria rhopalophylla.*

rigidum. Per., woody, with very stiff erect branches, 1 ft. and more: lvs. 3-angled, green, less than ½ in. long: fls. white, petals about ¼ in. long.

roseum: *Lampranthus glomeratus.*

serratum: *Erepsia serrata.*

serrulatum. Shrubby, with ascending branches: lvs. somewhat scimitar-shaped, thick and 3-angled, serrulate, more or less glaucous, to 1½ in. long: fls. purplish, the 2-toothed petals a little exceeding the calyx-lobes.

speciosum. Somewhat shrubby, to 2 ft., glistening when young: lvs. opposite, terete or indistinctly flattened above, to 1 in. long: fls. scarlet to brownish, to 2 in. or more across, mostly on long pedicels, showy.

spectabile. Somewhat woody per., with long prostrate flowering sts.: lvs. crowded, 3-angled, pointed, glaucous, incurved, to 3 in. long: fls. purplish with white filaments; also var. **alba** and var. **rosea.**

splendens: *Aridaria splendens.*

superbum: listed name.

Thunbergii: *Malephora Thunbergii.*

tigrinum: *Faucaria tigrina.*

tortuosum: *Sceletium tortuosum.*

tricolor: *Dorotheanthus gramineus.*

tricolorum: sometimes cited as if identical with *M. tricolor*, but the *M. tricolorum* of botanists (Haworth) is a very different plant and probably not in cult. with us.

trigonum: listed name.

truncatellum. Now properly *Conophytum truncatellum:* stemless and much depressed, the plant less than 1 in. high, somewhat glaucous with rather indistinct dots: fls. straw-colored.

verruculatum. Per. to 1 ft. or more, branches twisted or crooked: lvs. fascicled, cylindric, mealy, to 1½ in. long: fls. yellow, the petals scarcely longer than calyx.—A doubtful species.

violaceum: *Lampranthus emarginatus.*

Zeyheri: *Lampranthus Zeyheri.*

MESPILUS. *Rosaceæ.* One deciduous small tree from Eu. and Asia Minor, grown for the edible fr. **M. germanica** (*Pyrus germanica*). Medlar. To 20 ft., sometimes thorny: lvs. oblong, to 5 in. long, finely toothed: fls. white, to 2 in. across, solitary on shoots of the season: fr. an apple-shaped open-topped pome 1–2 in. across, eaten out of hand when fully ripe or bletted, or made into preserves.—It is hardy N. Propagated by seeds which are slow in germinating and by grafting or budding on seedling stock or on the pear, quince or hawthorn.

MESQUITE: *Prosopis glandulosa.*

METROSIDEROS. *Myrtaceæ.* Trees or shrubs native in New Zeal., Australia and Pacific Isls., having mostly opposite simple lvs., showy white or red fls. in cymes or racemes, the stamens long-exserted, and fr. a leathery caps.; planted for ornament in warm regions, as in Calif. Propagated by cuttings. Sometimes listed as "Iron-tree." The following are from New Zeal. except one.

citrina: *Callistemon lanceolatus.*

Colensoi. Climbing shrub: lvs. to ¾ in. long, ovate or ovate-lanceolate, densely pubescent when young: fls. pink or whitish, in cymes to 1½ in. long.

diffusa. Climbing shrub: lvs. to 1½ in. long, oblong or ovate, leathery: fls. crimson, in terminal branched cymes.

floribunda: *Callistemon lanceolatus.*

florida. Climbing shrub: lvs. to 3 in. long, elliptic-oblong, leathery: fls. orange-red, in terminal cymes. Var. **aurata** has yellow or yellowish-orange fls.

lucida. Tree to 60 ft.: lvs. to 3 in. long, lanceolate, leathery: fls. bright red, in short terminal cymes.

Parkinsonii. Shrub with prostrate branches or tree to 30 ft.: lvs. to 3 in. long, ovate-lanceolate, leathery: fls. red, in dense cymes usually on old wood.

perforata: *M. scandens.*

robusta. Rata. Tree to 100 ft.: lvs. to 1½ in. long, ovate-oblong or elliptic-lanceolate, leathery: fls. dark red, in dense terminal cymes.—Commonly starts as an epiphyte.

scandens (*M. perforata*). Climbing shrub: lvs. to ½ in. long, ovate to orbicular, leathery and shining: fls. white, in terminal leafy panicles.

semperflorens: *Callistemon lanceolatus.*

tomentosa. Tree to 70 ft.: lvs. to 4 in. long, lanceolate to oblong, leathery, usually white-tomentose beneath: fls. dark red, in dense terminal cymes.

tremuloides. Small tree: lvs. to 2 in. long, narrow-lanceolate, leathery, shining above: fls. bright red. Hawaii.

villosa. Tree to 60 ft.: lvs. to 2 in. long, ovate or oblong, very leathery, white-tomentose beneath: fls. scarlet, in small terminal cymes.

MEUM. *Umbelliferæ.* One per. tufted aromatic herb to 2 ft. high, native in the mts. of Eu. and planted for ornament. **M. athamanticum.** Lvs. mostly basal, pinnately divided into fine segms.: fls. white to pink, in compound terminal umbels: fr. ribbed.—Propagated by seeds and division.

MICHAUXIA. *Campanulaceæ.* Bien. or per. herbs of Asia Minor, one sometimes planted in the border: lvs. toothed or lobed: fls. white or pink, 8–10-parted: caps. opening laterally. Propagated by seeds.

campanuloides. To 5 ft.: lvs. lanceolate, irregularly toothed, bristly-hairy: fls. white tinged purple, to 2 in. long, drooping, the segms. becoming reflexed.

MICHELIA. *Magnoliaceæ.* Asian trees or shrubs resembling Magnolia but with axillary fls. and with a long gynophore or stipe to the ovary; planted in S. U. S. Propagated by seeds and cuttings of ripe wood under glass.

Champaca. Tall evergreen tree: lvs. lanceolate-ovate, to 10 in. long: fls. yellow or orange, very fragrant, to 2½ in. across. Himalayas.

compressa (*Magnolia compressa*). Evergreen tree to 40 ft.: lvs. oblong, to 4 in. long: fls. yellow, fragrant, 1 in. across. Japan.

fuscata (*Magnolia fuscata*). BANANA-SHRUB. Evergreen shrub to 15 ft., the branchlets brown-tomentose: lvs. elliptic to oblong, to 3 in. long: fls. brownish-yellow edged with red, with banana fragrance, to 1½ in. across. China.

MICONIA. *Melastomaceæ.* Trop. American shrubs or trees grown in greenhouses for the large attractive lvs., having rather small white, rose, purple or yellow fls., and berry-like frs.

Miconias should be grown in fibrous soil, given abundant moisture, and screened from the direct rays of the sun. Propagated by cuttings of firm wood over heat.

magnifica (*Cyanophyllum magnificum*). Lvs. broadly ovate, to 2½ ft. long, wavy-margined, reddish-bronze beneath with white or light green veins. Mex.

MICRAMPELIS: *Echinocystis lobata.*

MICRANTHES: *Saxifraga.*

MICROCITRUS. *Rutaceæ.* Four Australian very spiny shrubs or small trees, as now known, introduced into this country as interesting citrus allies and as possible material for hybridization and for stocks. They differ from Citrus in the small fls., stamens not united, few-celled ovary and fr., and in foliage characters. **M. australasica,** FINGER-LIME, probably best known here, grows to 30 or 40 ft.: juvenile lvs. very small; mature lvs. obovate or rhomboidal, to 1½ in. long: fr. elongated, to 4 in. long by 1 in. thick, the juice acid.—Hardier than lemon and lime, and promising for experiment; it has been crossed with *Citrus mitis.*

MICROCYCAS. *Cycadaceæ.* One species in W. Cuba, much like Zamia except in scales of staminate cone. **M. calocoma,** CORCHO, which is sometimes planted in collections, reaches tree dimensions (to 30 ft.), sometimes with a few short branches: lvs. to 3 ft. long, pubescent; lfts. to about 80 pairs, long-linear and acuminate, margins somewhat revolute, the veins parallel but no midrib: staminate cone very large.

MICROGLOSSA. *Compositæ.* Asian and African shrubs, sometimes climbing, with alternate commonly entire lvs. and heads in panicles or corymbs, the ray-fls. white or bluish; pappus of hairs. Grown for ornament.

albescens (*Aster cabulicus*). To 3 ft.: lvs. lanceolate, to 5 in. long, gray-tomentose beneath: heads ⅓ in. across, borne in corymbs to 6 in. across, ray-fls. lilac, disk yellow. Himalayas, China.

MICROLEPIA. *Polypodiaceæ.* Trop. and subtrop. ferns similar to Davallia but differing in the character of the indusia. Graceful plants requiring the usual greenhouse treatment. See *Ferns.*

platyphylla. Lvs. to 4 ft. long, 3-pinnatifid, segms. broad and toothed, glabrous and shining when old, on stipes to 3 ft. long. India to Japan.

MICROMERIA. *Labiatæ.* Per. usually trailing herbs with small lvs. and small 2-lipped fls. in axillary whorls or terminal spikes; adapted to the rock-garden. Propagated by seeds, cuttings and division.

Chamissonis (*M. Douglasii*). YERBA BUENA. Sts. to 2 ft. long, rooting at tips: lvs. round, to 1 in. long, wavy, pubescent: fls. white, ¼ in. long, usually solitary. B. C. to Calif.

Douglasii: *M. Chamissonis.*

Piperella. To 6 in.: lvs. ovate, glabrous: fls. reddish-purple, in few-fld. clusters. S. Eu.

MICROSERIS: *Uropappus linearifolius.*

MICROSTYLIS. *Orchidaceæ.* Low bulbous orchids with small fls. having linear or filiform petals and entire or lobed lip; planted in the wild-garden or woodsy places.

unifolia (*Malaxis unifolia*). To 10 in.: lf. solitary, oval to orbicular, to 2½ in. long: fls. greenish, in racemes to 3 in. long, lip 3-lobed. Newf. to Fla. and Ala.

MIDRIB: the main rib of a leaf or leaf-like part; a continuation of the petiole or petiolule.

MIGNONETTE: *Reseda.* -Tree: *Lawsonia inermis.* -Vine: *Boussingaultia baselloides.*

MIKANIA. *Compositæ.* American twining herbs or shrubs with opposite lvs. and 4-fld. heads of white or pink disk-fls. borne in panicled cymes; pappus of bristles. Allied to Eupatorium and requiring similar treatment.

scandens. CLIMBING HEMPWEED. Twining to 15 ft., glabrous: lvs. ovate or hastate, to 4 in. long, deeply cordate at base, long-acuminate. Me. to Fla. and Tex. and S. Amer.—Adaptable for colonizing in wild places.

MILFOIL: *Achillea Millefolium.* Water: *Myriophyllum*

MILK-BUSH: *Euphorbia Tirucalli.* African: *Synadenium Grantii.*

MILKWEED: *Asclepias.*

MILKWORT: *Polygala.*

MILLA. *Liliaceæ.* One bulbous herb native in Ariz., New Mex. and Mex. **M. biflora.** MEXICAN STAR. Lvs. basal and grass-like: fls. fragrant, waxy-white, to 2½ in. across, 1–5 together terminating a scape to 1½ ft. high.—Sometimes erroneously cult. under the name *Bessera elegans.* Several bulbs may be planted in one pot and grown in the greenhouse for late winter and early spring bloom; or the bulbs may be planted out-of-doors and the bulbs lifted and stored over winter. *M. uniflora* is *Brodiæa uniflora.*

MILLET: *Panicum miliaceum, Setaria italica.* **African:** *Eleusine coracana, Pennisetum glaucum.* **Broom-Corn:** *Panicum miliaceum.* **Foxtail:** *Setaria italica.* **Indian:** *Pennisetum glaucum.* **Japanese Barnyard:** *Echinochloa Crus-galli* var. *edulis.* **Pearl:** *Pennisetum glaucum.* **Siberian:** *Setaria italica* var. *rubrofructa.* **Texas:** *Panicum texanum.* **Turkestan:** *Setaria italica* var. *rubrofructa.*

MILLETTIA: *Wisteria.*

MILTONIA. *Orchidaceæ.* S. American epiphytes allied to Odontoglossum and requiring similar treatment, with 1- or 2-lvd. pseudobulbs and sheathing lvs. at base and fls. solitary or in loose racemes, the sepals and petals nearly equal, the lip expanded and not 3-lobed. For cult. see *Orchids.*

Bleuana. Hybrid between *M. vexillaria* and *M. Roezlii.*

Bluntii. Supposed to be a natural hybrid between *M. Clowesii* and *M. spectabilis.*

candida. Pseudobulbs with 2 lvs. to 1 ft. long: fls. 3½ in. across, in 3–7-fld. racemes to 20 in. long; sepals and petals greenish-yellow with large brown spots; lip white, wavy, Aug.–Nov. Brazil.

Clowesii. Pseudobulbs with 2 lvs. to 1 ft. long: fls. 3 in. across, in 7–10-fld. racemes to 20 in. long; sepals and petals yellow with large brown spots; lip white with violet base, Sept.–Nov. Brazil.

cuneata. Pseudobulbs with 2 lvs. to 1 ft. long: fls. 3 in. across, in 5–8-fld. racemes to 1½ ft. high; sepals and petals yellow spotted with brown except at tips; lip creamy-white, Feb.–Mar. Brazil.

flavescens. Pseudobulbs with 2 lvs. to 1 ft. long and ¾ in. wide: fls. yellow, the lip marked with red, in 6–12-fld. racemes to 14 in. high, June–Oct. Brazil.

Hyeana. Hybrid between *M. Bleuana* and *M. vexillaria.*

lævis (*Odontoglossum læve*). Pseudobulbs with 2 lvs. to 14 in. long and 2 in. wide: fls. in many-fld. panicles to 2½ ft. high; sepals and petals yellow with large brown spots; lip white, violet at base, June–Aug. Guatemala.

Phalænopsis. Pseudobulbs with 1 lf. to 9 in. long: fls. white, the lower part of lip purple, 2 in. across, in 2–4-fld. racemes to 6 in. high, Aug.–Nov. Colombia. Var. **alba** has white fls. with lip slightly marked with yellow.

Regnelli. Pseudobulbs with 2 lvs. to 1 ft. long: fls. 2 in. across, in 4–7-fld. racemes to 14 in. high; sepals and petals white; lip violet, edged with white, July–Sept. Brazil.

Roezlii. Pseudobulbs with 1 lf. to 1 ft. long: fls. 3 in. across, in 2–6-fld. racemes; sepals and petals white with purple blotch at base; lip white with yellow callus and 4 red-brown spots, Oct.–Nov. Colombia. Var. **alba** has pure white fls.

Russelliana. Fls. in 6–9-fld. racemes; sepals and petals reddish-brown; lip violet tinged with yellow and tipped white, Dec. Brazil.

spectabilis. Pseudobulbs with 2 lvs. to 6 in. long: fls. solitary, about 4 in. across; sepals and petals white; lip rose-purple with darker center and nerves, Aug. Brazil. Var. **Moreliana** has larger fls. with deep purple sepals and petals and violet-rose lip.

vexillaria. Pseudobulbs with 1 lf. to 1 ft. long: fls. about 4 in. long, in 3–4-fld. racemes; sepals and petals rose; lip rose with white base and edges, May–June. Colombia. Some of the hort. vars. are **gigantea, Lambeauiana** and **Leopoldii.**

Warscewiczii (*Oncidium fuscatum*). Pseudobulbs with 1 lf. to 8 in. long and 1½ in. wide: fls. about 2 in. across; sepals and petals brown edged and tipped with white, wavy; lip violet edged with white with a white or yellow spot, Mar.–Apr. Peru.

MIMOSA. *Leguminosæ.* Herbs, shrubs and trees with feathery bipinnate foliage, in some species sensitive, small fls. in heads or spikes, and fr. a flat pod made up of 1-seeded parts; native mostly in trop. Amer. Some of the acacias and other plants are sold under the name Mimosa. A few of the shrub and tree species are planted for ornament in warm countries, and the sensitive-plant in conservatories. Cult. as for *Acacia.*

acanthocarpa: *M. aculeaticarpa.*

aculeaticarpa (*M. acanthocarpa*). Spiny shrub or small tree: fls. white or pink, in heads. Mex.

albida. Spiny shrub to 10 ft., gray-pubescent: fls. pinkish, in heads. Mex. to Peru.

argentea. Climbing: lvs. pinkish below and partially silvery-gray. Brazil.

Nemu: *Albizzia Julibrissin.*

pudica. SENSITIVE-PLANT. HUMBLE-PLANT. Spiny per. but cult. as an ann.: lvs. sensitive: fls. lavender, in heads. Brazil; nat. in warm countries, running wild in Gulf states.

Spegozzinii. Spiny shrub: lvs. sensitive: fls. rose-purple, in heads. Argentina. Var. **glauca,** fls. white.—A good greenhouse species, intro. into Calif.

MIMOSACEÆ: *Leguminosæ.*

MIMULUS (incl. *Diplacus*). MONKEY-FLOWER. *Scrophulariaceæ.* Decumbent or erect ann. and per. herbs or sometimes sub-shrubs with usually showy tubular 2-lipped fls. often spotted, giving more or less the effect of a face (personate), either solitary and axillary or in terminal racemes: lvs. opposite, entire or toothed.

Monkey-flowers are grown in the greenhouse and in the border and some of the large kinds in the general garden in California. In the open, glasshouse kinds of mimulus profit by a shady or semi-shady situation and plenty of water, but some of the semi-shrubby kinds of the Pacific Coast may not require such protection. The greenhouse and florists kinds are propagated by seed sown from January to April, in a mixture of equal parts of loam, leaf-mold and sand, and kept in a temperature of 60° until germination; cuttings and division are also used. *M. luteus* is the chief source of flower-garden and conservatory kinds, with large often spotted flowers.

alpinus: *M. luteus* var.

aurantiacus (*M. glutinosus. Diplacus glutinosus*). BUSH M. Shrub to 4 ft.: lvs. oblong, to 2 in. long, densely pubescent beneath: fls. deep yellow, to 1½ in. long, the spreading lobes toothed or notched. Ore., Calif.

brevipes. Ann., sticky-pubescent, to 2 ft.: st.-lvs. lanceolate to linear, to 3 in. long: fls. yellow, bell-shaped, 2-lipped, to 2 in. long. Calif.

Breweri. Ann. to 6 in., pubescent: lvs. oblong or linear, to ¾ in. long: fls. pink or red, funnel-shaped, ⅓ in. long. B. C. to Ida. and Calif.

cardinalis. Per. with erect or weak sts. to 1 ft., sticky-pubescent: lvs. obovate, to 4½ in. long: fls. scarlet, seldom yellow, to 2 in. long, 2-lipped, stamens exserted. Utah to Ore. and Lower Calif.

cupreus. CHILEAN M. Ann. to 8 in.: lvs. ovate, to 1¼ in. long, 3–5-nerved from base: fls. yellow becoming brilliant copper color, to 1½ in. long, lobes spreading. Chile.

Fremonti. Ann. to 8 in., sticky-pubescent: lvs. oblong, to 1 in. long: fls. crimson, 1 in. long, broadly funnel-shaped. Calif.

glutinosus: *M. aurantiacus.*

guttatus (*M. Langsdorfii*). Ann. or per. to 1½ ft.: lvs. ovate to oblong-lanceolate, to 6 in. long: fls. yellow, usually with red-spotted throat, to 1½ in. long, 2-lipped, calyx much inflated in fr. Alaska to Mex.

Langsdorfii: *M. guttatus.*

leptanthus (*Diplacus leptanthus* and *grandiflorus*). Shrub to 3 ft., pubescent: lvs. oblong, to 2 in. long: fls. yellow, to 2½ in. long, the lobes notched. Calif.

Lewisii. Per. to 2½ ft., sticky-pubescent: lvs. oblong, to 3 in. long: fls. rose-red or pink, to 2 in. long. B. C. to Calif. and Utah.

longiflorus (*Diplacus longiflorus. M. glutinosus* var. *brachypus*). Shrub to 3 ft.: lvs. lanceolate, to 3 in. long, pubescent beneath: fls. cream-color to salmon-yellow, to 3 in. long, lobes cut or wavy. S. Calif. Var. **rutilans** is glandular-pubescent with dark red fls.

luteus. Per., sts. to 1 ft. long, prostrate: lvs. broad-ovate, 1 in. long, 5–7-nerved from base: fls. yellow spotted with red or purple, to 1½ in. long. Chile. Var. **alpinus**, to 6 in., erect; **rivularis**, middle lobes of lower lip with large red spot; **variegatus**, throat pale yellow, lobes margined with pinkish-purple; **Youngeana**, each lobe spotted.

moschatus. MUSK-PLANT. Per. with spreading and creeping stolons to 1 ft. long, sticky-hairy, with a musky odor: lvs. ovate, to 1½ in. long: fls. pale yellow, lightly dotted with brown, to ¾ in. long. Mont. to Calif.

nasutus. Ann. to 2 ft.: lvs. ovate or oblong, to 4 in. long, toothed or lobed: fls. spotted with red-brown, to 1 in. long, 2-lipped. B. C. to N. Mex. and Rocky Mts.

puniceus (*M. glutinosus* var. *puniceus. Diplacus puniceus*). Shrub to 6 ft., sticky: lvs. linear, to 2½ in. long: fls. red, to 1½ in. long. S. Calif.

quinquevulnerus: hort. name for *M. luteus.*

ringens. ALLEGHENY M. Per. to 4 ft., sts. 4-angled: lvs. oblong, to 4 in. long: fls. blue varying to pink or white, to 1½ in. long, 2-lipped, throat very narrow. N. S. to Man., Va., Tex.

tigrinus. Hybrids (or other cultigens) between *M. luteus* and *M. guttatus* with large fls.

Tilingi. Per., sts. creeping, to 8 in. long: lvs. broad-ovate, 3–5-nerved from base: fls. yellow spotted red, to 1½ in. long, calyx inflated in fr. Mont. to Calif.

MIMUSOPS. *Sapotaceæ.* A large number of milky-juiced thick-lvd. evergreen trees in the tropics of both hemispheres, some planted in warm countries for ornament and interest as well perhaps as for the frs. and for the production of rubber: lvs. simple and entire, mostly glossy, without prominent side nerves: fls. bisexual, white or whitish, not showy, single or clustered in axils, the corolla of 6 or more lobes: fr. an ovoid or globose large-seeded berry. Propagated by seeds; they have been employed as stock for sapodilla.

Balata. To 100 ft. and more: lvs. oblong-obovate, to 8 in. long: fls. 10 or more, outside corolla-lobes lobed: fr. about 1 in. long. Farther W. Indies, Venezuela, Guiana.—A source of balata rubber.

Elengi. SPANISH-CHERRY. Tree to 30 ft. and more, with spreading top: lvs. elliptic or oval, obtuse or bluntly acute, to 4 in. long: fls. white, about ½ in. across, the parts acute: fr. ovoid, yellow, nearly 1 in. long, edible. E. Indies.

MINA: *Quamoclit lobata.*

MINT: *Mentha.* Horse-: *Monarda.* Mountain-: *Pycnanthemum.* Stone-: *Cunila origanoides.*

MIRABILIS. *Nyctaginaceæ.* Per. herbs with colored tubular calyx resembling a corolla and spreading 5-lobed limb; roots often tuberous; about a dozen species in the warmer parts of Amer., a few grown in flower-gardens.

Mirabilis species are grown as tender annuals from seed sown where plants are to stand; roots may be taken up and stored over winter.

californica. To 3 ft., sticky-pubescent: fls. rose-purple, ½ in. long. Calif.

divaricata. Differs from *M. Jalapa* in the longer-stalked lvs. which are not cordate at base, and the tube of the purple or rose fls. being narrower. Madeira.

Jalapa. FOUR-O'CLOCK. MARVEL-OF-PERU. To 3 ft., glabrous or nearly so: fls. in shades of red, yellow and white, often striped and mottled, the tube 1–2 in. long, opening in late afternoon. Trop. Amer.—Known as an ann., but the roots are deep and tuberous.

longiflora. To 3 ft., glandular-pubescent: fls. white, rose or violet, the tube 4–6 in. long. Mex.

multiflora (*Quamoclidion multiflorum*). To 3 ft.: fls. rose or purple, the tube to 2 in. long. Colo. to Tex.

MIRASOLIA: *Tithonia diversifolia.*

MIRLITON: see *Chayote.*

MISCANTHUS (*Eulalia*). *Gramineæ.* Tall bold broad-lvd. perennials with awned spikelets in large terminal silky panicles; native in Old World and one species grown for striking effects. See *Grasses.*

sinensis (*Eulalia japonica*). EULALIA. Common landscape grasses: to 10 ft., forming leafy clumps: lvs. to 3 ft. long and 1 in. wide, with prominent whitish midrib: panicles to 2 ft. long, branches spreading or drooping, silky. China, Japan; somewhat escaped in N. Amer.; hardy N. Var. **gracillimus** has channelled lvs. to ¼ in. wide. Var. **variegatus** has lvs. striped white or yellowish and in var. **zebrinus**, ZEBRA-GRASS, they are banded.

MIST-FLOWER: *Eupatorium cœlestinum.*

MISTLETOE: see *Loranthaceæ.*

MITCHELLA. *Rubiaceæ.* One N. American evergreen herb, barely woody, with trailing rooting sts. to 1 ft. long, useful in the rock-garden or as a ground-cover beneath trees. **M. repens.** PARTRIDGE-BERRY. TWIN-BERRY. SQUAW-BERRY. Lvs. orbicular-ovate, to ¾ in. long, dark green and shining above and often with white lines: fls. twin, white, ½ in. long, with 4 spreading lobes bearded inside: fr. scarlet, ⅓ in. across, white in var. **leucocarpa.**

MITELLA. BISHOPS-CAP. *Saxifragaceæ.* Per. small delicate woods herbs with heart-shaped mostly basal lvs. and small white or greenish fls. in racemes, the petals pinnately cut; native in N. Amer. and E. Asia. Sometimes transferred to the wild-garden.

caulescens (*Mitellastra caulescens*). Scapes to 1 ft., with 1–3 lvs.: fls. yellowish-green, in loose racemes, May–July. B. C. to Mont. and N. Calif.

diphylla. Scapes to 1½ ft., with one pair of opposite nearly or quite sessile lvs.: fls. white, in racemes to 8 in. long, Apr.–May. Que. to N. C. and Mo.

nuda. Scapes to 8 in., usually leafless: fls. yellowish-green, in few-fld. racemes, Apr.–June. N. N. Amer., Asia.

oppositifolia. St.-lvs. long-petioled: divisions of petals filiform. Cent. N. Y.

pentandra (*Pectiantia pentandra*). Scapes to 1 ft. high, naked: fls. greenish, in loose racemes, June–Aug. Alaska to Calif.

MITELLASTRA: *Mitella caulescens.*

MITRARIA. *Gesneriaceæ.* One climbing evergreen shrub from Chile, grown under glass or out-of-doors in mild climates and of easy cult. **M. coccinea.** Lvs. opposite, ovate, to 1 in. long, with few coarse teeth: fls.

scarlet, to 1½ in. long, tubular, drooping on long stalks; stamens exserted.

MITREWORT, FALSE: *Tiarella.*

MITSUMATA: *Edgeworthia papyrifera.*

MOCASSIN-FLOWER: *Cypripedium.*

MOCKERNUT: *Carya alba.*

MOHRODENDRON: *Halesia.*

MOLDAVICA: *Dracocephalum.*

MOLE-PLANT: *Euphorbia Lathyrus.*

MOLINIA. *Gramineæ.* Tufted per. grasses with narrow lvs. and spikelets in interrupted panicles; native in Eu. and Asia and one of some ornamental value. See *Grasses.*

cærulea (*Aira cærulea*). To 5 ft.: lvs. to 1 ft. long and ¼ in. wide, rather stiff: panicles to 1½ ft. long, green or purplish. Eu.; nat. in E. U. S.

MOLOPOSPERMUM. *Umbelliferæ.* One per. herb to 5 ft. high, native in mts. of Eu., sometimes planted for ornament. **M. cicutarium.** Lvs. ternately decompound, the ultimate segms. pinnatifid: fls. yellowish-white, small, in terminal umbels standing above the foliage.—Propagated by division or seed.

MOLTKIA. *Boraginaceæ.* Per. hairy herbs of S. Eu. and Asia, with alternate simple lvs. and blue or yellow fls. in terminal cymes or racemes; corolla funnel-shaped, the throat naked or hairy; stamens protruding. Allied to Lithospermum. Sometimes cult. in the rock-garden.

graminifolia: *M. suffruticosa.*

petræa (*Lithospermum petræum*). Hoary somewhat woody per. to 1 ft.: lvs. linear-oblong: fls. deep violet-blue, to ½ in. long. S. E. Eu.

suffruticosa (*M. graminifolia. Lithospermum graminifolium*). Subshrub to 1½ ft.: lvs. linear, white-tomentose beneath: fls. purple-blue, ½ in. long. Italy.

MOLUCELLA. *Labiatæ.* Herbaceous old-fashioned annuals, with toothed or cut lvs. and white or pink-tipped tubular 2-lipped fls. in axillary whorls subtended by spiny subulate bracts, the limb of calyx inflated and surpassing the corolla.

Molucellas are grown from seeds sown early in spring indoors, or *M. lævis* in the open where the season is long.

lævis. SHELL-FLOWER. MOLUCCA-BALM. To 3 ft.: lvs. round, to 1¼ in. long, toothed, long-stalked: fls. fragrant, white, the limb of greatly enlarged calyx with 5 slightly prickly angles. W. Asia.—Grown as a curiosity.

spinosa. To 8 ft., sometimes bien., sts. brownish-red: lvs. ovate, deeply cut: fls. white, the limb of calyx with 1 long spine above and 7 others below. S. Eu., Syria.

MOMBIN: *Spondias Mombin* and *purpurea.*

MOMORDICA. *Cucurbitaceæ.* Two ann. herbaceous tendril-bearing vines, out of 35–40 in the genus, are cult. for ornament and screens: monœcious or diœcious: lvs. in ours compound or deeply lobed: fls. yellow or white, rather showy (to 1 in. or more across), solitary in ours and the staminate peduncle bearing a broad bract: fr. nearly spherical to oblong, often splitting at maturity. Native in Old World tropics, one extensively nat. elsewhere. Quickly grown from seeds.

Balsamina. BALSAM-APPLE. Lvs. thin, 1–4 in. across, with very sharp lobes and teeth, lobed ½ or less of the width; bract of staminate peduncle on its upper part: fr. ovoid or ellipsoid, orange, to 3 in. long, narrowed both ends, with points or nearly smooth, bursting.

Charantia. BALSAM-PEAR. Lvs. deeply lobed and mostly less pointed: bract at middle of peduncle or lower: fr. oblong or ovoid, orange-yellow, 1–8 in. long, warty, bursting and showing red arils. Nat. Fla. south.—The commoner species.

Elaterium: *Ecballium Elaterium.*

MONARDA. HORSE-MINT. *Labiatæ.* Ann. or per. aromatic N. American herbs, with opposite toothed lvs. and rather large strongly 2-lipped fls. in dense terminal and axillary bracted showy clusters.

Horse-mints are rather coarse plants but striking in masses in the wild-garden. Of easy cultivation. Propagated by division of plants in the spring.

Bradburiana. Per. to 2 ft.: lvs. ovate or ovate-lanceolate, to 3½ in. long, sessile: fls. pink to white spotted with purple, 1 in. long, in terminal clusters, the bracts green or purplish. Ind. to Ala. and Ark.

coccinea: *M. didyma.*

didyma (*M. coccinea. M. Kalmiana*). OSWEGO-TEA. BEE- or FRAGRANT-BALM. Per. to 3 ft.: lvs. ovate or ovate-lanceolate, to 6 in. long, petioled: fls. scarlet, to 2 in. long, in terminal clusters, bracts tinged red. Que. to Ga. and Tenn.—Color forms are **alba, rosea, salmonea, violacea superba.**

fistulosa. WILD BERGAMOT. Per. to 3 ft.: lvs. lanceolate to ovate, to 4 in. long, petioled: fls. lilac to purple, 1½ in. long, in terminal clusters, the bracts whitish or purplish. Me. to Fla. and La. Var. **alba** has white fls.

florariensis: hort. name.

hybrida: hort. name of no botanical standing.

Kalmiana: *M. didyma.*

lasiodonta. Per. to 1½ ft.: lvs. linear-lanceolate, to 2 in. long: fls. yellowish, ½ in. long, in axillary and terminal clusters, the bracts white. Okla. to Ariz.

media (*M. fistulosa* var. *media*). Per. to 3½ ft.: lvs. ovate or ovate-lanceolate, to 5 in. long, petioled: fls. purple or purple-red, 1½ in. long, in terminal clusters, the bracts purple. Me. to Va.

mollis (*M. fistulosa* var. *mollis*). Per. to 3½ ft., with close pubescence: lvs. ovate to lanceolate, to 3½ in. long, short-petioled: fls. lilac to pink, 1¼ in. long, in terminal clusters, the bracts green or pink. N. Amer.

punctata. Per. to 3 ft.: lvs. lanceolate, to 3 in. long, petioled: fls. yellowish spotted with purple, 1 in. long, in axillary and terminal clusters, the bracts white or purplish. S. N. Y. to Fla. and Tex.

Ramaleyi. Per. to 2 ft., sts. white-pubescent above: lvs. lanceolate or ovate-lanceolate, short-petioled: fls. lilac, 1 in. long, in terminal clusters, the bracts tinged purple. Colo.

Russelliana. Per. to 2 ft.: lvs. lanceolate to ovate-lanceolate, nearly sessile: fls. lilac veined with purple, 1 in. long, in terminal clusters, the bracts purplish. Ark.

MONARDELLA. *Labiatæ.* California fragrant herbs with purple, rose or white 2-lipped fls. in terminal heads subtended by an involucre. Sometimes grown in the rock-garden. Propagated by division in spring.

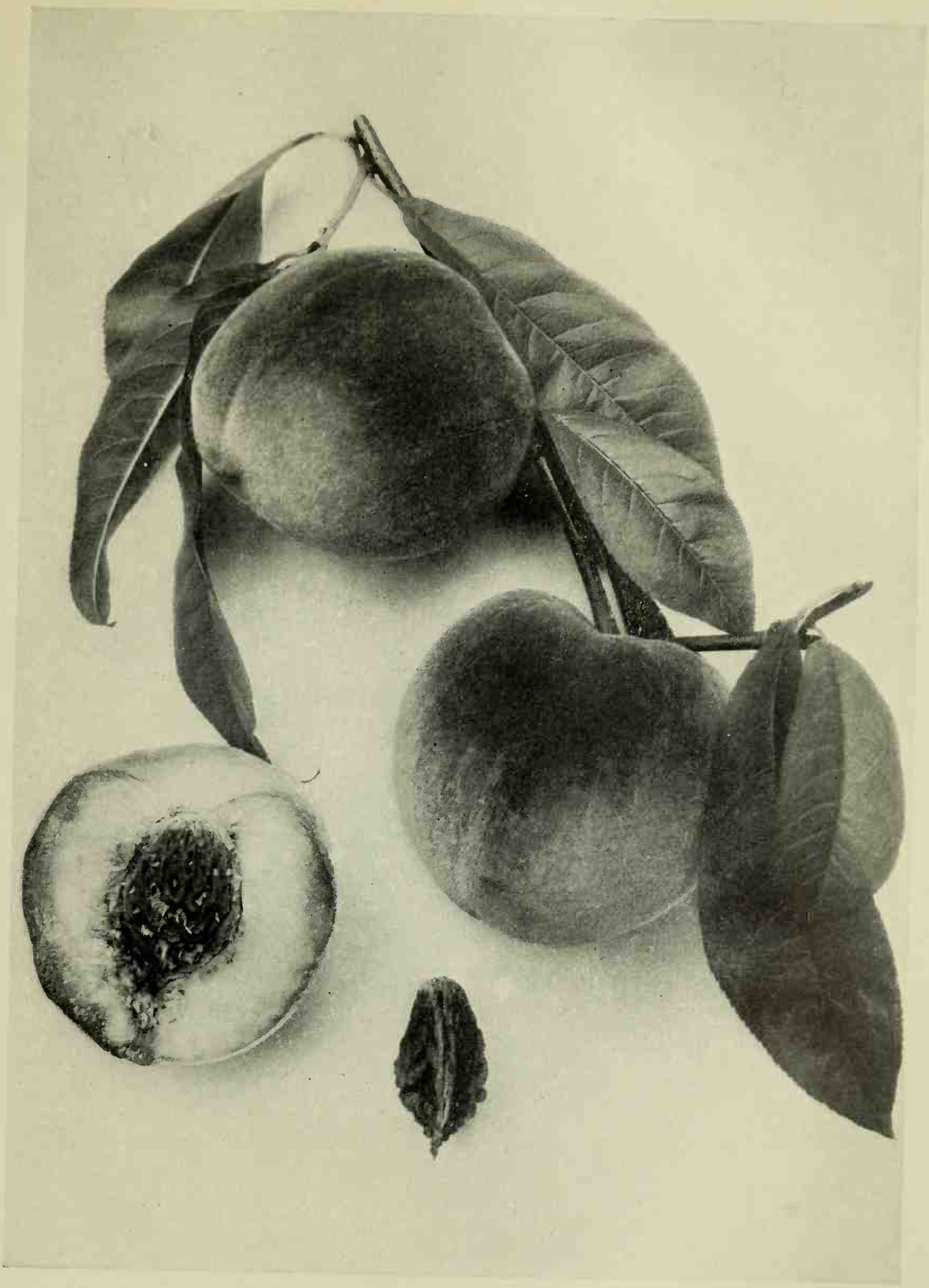
lanceolata. Ann. to 2½ ft., somewhat pubescent: lvs. oblong-lanceolate to lanceolate, to 2 in. long, entire: fls. rose-purple.

macrantha. Tufted per. to 1 ft., pubescent: lvs. ovate, to 1 in. long, mostly with entire revolute margins: fls. orange-red, 1½ in. long.

villosa. Per. to 1½ ft., pubescent: lvs. ovate, to 1 in. long, slightly toothed: fls. purple, pink or white, about ½ in. long.

MONDIA: *Chlorocodon.*

MONDO (*Ophiopogon*). LILY-TURF. *Liliaceæ.* Evergreen sod-forming stemless per.



XI. PEACH. — The Crawford type, one of the old and prized families of peaches

narrow-lvd. herbs of E. Asia, not many species, valuable as ground-cover and as pot and porch plants, sometimes seen in the conservatory. The following species are adaptable in parts of N. Y.: fls. small, bluish or white, drooping, borne in racemes among the foliage, the ovary inferior, the filaments very short and anthers pointed: fr. berry-like and 1-seeded, blue. The cult. is simple in sun or shade. Propagated by division.

Jaburan (*O. Jaburan*). Jaburan or White L. Roots stout and cord-like, tubers none: lvs. long and grass-like, to 2 ft. or more, and about ½ in. broad: fls. white, ½ in. or more long, in a short terminal raceme: fr. oblong, violet-blue. Japan. Var. **vittata** has lighter-striped lvs.—*Liriope Muscari* often passes as *M.* (or *Ophiopogon*) *Jaburan.*

japonicum (*O. japonica*). Dwarf L. Low, with long underground stolons and the roots tuber-bearing: lvs. many, to 10 or 12 in. long, dark green, commonly curved: fls. small, light lilac, in a short loose raceme: fr. blue, size of pea. Japan, Korea.—An excellent sod-forming plant.

MONESES. *Pyrolaceæ* or *Ericaceæ.* One evergreen per. herb to 6 in. high, native in woods of N. N. Amer., Eu. and Asia and sometimes planted in the wild-garden. **M. uniflora** (*Pyrola uniflora*). One-flowered Shinleaf. Lvs. near base of st., orbicular or ovate, to 1 in. long, wavy-toothed: fls. white or pink, fragrant, to ¾ in. across, solitary and nodding: caps. ¼ in. across.

MONEYWORT: *Lysimachia Nummularia.*

MONIMIACEÆ. Monimia Family. About 30 genera in the tropics, trees and shrubs with opposite simple lvs., mostly bisexual polypetalous fls. having inconspicuous perianth, numerous stamens, many 1-celled carpels, and fr. an achene or drupe borne on the receptacle. Hedycarya, Laurelia and Peumus may be cult. in warm climates.

MONIMIA FAMILY: *Monimiaceæ.*

MONKEY-BREAD TREE: *Adansonia digitata.* **-Flower:** *Mimulus.* **-Pod:** *Samanea Saman.* **-Puzzle:** *Araucaria araucana.*

MONKSHOOD: *Aconitum.*

MONOCOTYLEDON: a plant bearing only one cotyledon or seed-leaf, in distinction from those that have two (dicotyledon) or more seed-leaves in the embryo; the cotyledons become apparent in germination. **Monocotyledonous:** adjective, pertaining to monocotyledons. The monocotyledons (in speech sometimes shortened to "monocots") are those of endogenous internal structure, lacking true separable bark or cortex; they were formerly known as endogens. Mostly these plants have parallel-veined leaves and floral parts in threes or multiples of three. Few of them are tall trees, many of the palms being exceptions. Monocotyledonous plants comprise all the grasses, cereal grains, sedges, banana, lilies, aroids, bromeliads, irids, cannas, orchids.

MONŒCIOUS: staminate and pistillate flowers on the same plant.

MONOTAGMA. *Marantaceæ.* Per. herbs from S. Amer., with creeping rootstocks, long-petioled basal lvs. and fls. borne in bracted spikes; sometimes grown for the ornamental foliage. Cult. as for *Calathea.*

smaragdinum (*Calathea* and *Maranta smaragdina*). To 1½ ft.: lvs. lanceolate or oblong-lanceolate, emerald-green above with dark green central stripe, pale green beneath. Ecuador.

MONOTROPA. *Monotropaceæ* (see *Pyrolaceæ*). Saprophytic white herbs with leafless bracted scapes bearing a solitary nodding fl. with 2–4 deciduous sepals and 5–6 petals; 2 species in N. and S. Amer. and Asia, one of them sometimes transferred for curiosity under proper woods conditions.

uniflora. Indian Pipe. To 10 in., the scapes white-bracted and lacking chlorophyll: fls. white, to 1 in. long: caps. erect, ½ in. long. N. Amer., Mex., Japan, Himalayas.

MONSTERA. *Araceæ.* Trop. American woody-stemmed large strong climbers with large thick lvs. which are entire, pinnately cut and sometimes perforated, long sheathing petioles, and bisexual fls. on densely-fld. spadices surrounded by boat-shaped spathes; grown under glass as a curiosity.

Monsteras are not particular as to soil and thrive in pots, tubs and beds in the greenhouse or in the open far South. Propagated by cuttings of the growing stems placed in pots and kept in a humid hot atmosphere.

deliciosa (*Philodendron pertusum*). Ceriman. Straggling climber, having long hanging cord-like aerial roots: lvs. to 3 ft. long and wide, pinnately cut and perforated with large holes: spathes white, about 1 ft. long; spadix to 10 in. long, becoming a solid cone-like edible fr. Mex., Cent. Amer.

MONTANOA. *Compositæ.* Shrubs or small trees native Mex. to N. S. Amer., with opposite lvs. and white or rose heads of ray- and disk-fls. borne in panicled cymes; pappus none.

Propagated by seeds under glass and by cuttings; grown under glass and out-of-doors in warm climates for the large leaves and bold habit as well as for the showy heads.

bipinnatifida (*Polymnia grandis*). To 8 ft., shrubby: lvs. pinnately cut, hairy: heads to 3 in. across, with white rays. Mex.

hibiscifolia. Shrub to 20 ft.: lvs palmately lobed to about middle, pubescent beneath, to 1 ft. across: heads to 1½ in. across, with white rays and yellow disk. Guatemala to Costa Rica.

MONTBRETIA: *Tritonia.*

MONTEZUMA (*Maga*). *Malvaceæ.* Two trees, one Porto Rican and one Cuban, distinguished from Thespesia by the large calyx breaking apart (circumscissile) and deciduous, with very large showy fls.: fr. an indehiscent leathery or fleshy pod.

speciosissima (*Thespesia grandiflora*). Tree to 40 or 50 ft.: lvs. thick, broadly cordate-ovate, acuminate, entire, 5–8 in. long: fls. long-peduncled, 5–6 in. across, glossy red and very veiny. Porto Rico, once thought to be Mexican.—Planted in S. Fla.

MONTIA. *Portulacaceæ.* Small herbs with rather fleshy lvs., small white or pinkish fls., and capsular frs.; one sometimes grown as a salad and pot-herb and for interest, in moist places. Seeds may be sown where plants are to stand, any time in spring or summer.

perfoliata (*Claytonia* and *Limnia perfoliata*). Winter-Purslane. Ann. 4–12 in. or more: lvs. basal, rhombic-ovate and long-stalked: fls. white, in racemes subtended by 2 lvs. which are united into a round disk, on scapes to 1 ft. high. B. C. to Mex.

MONVILLEA. *Cactaceæ.* A few S. American night-blooming cacti with half-erect long slender sts.: fls. toward top of st., naked outside, the perianth persisting even after withering and in that respect differing from Cereus as well as in the absence of columnar sts. or trunks. See *Cacti.*

Cavendishii (*Cereus Cavendishii. C. splendens*). To 10 ft., more or less branched at base, sts. to 1 in. or somewhat more diam., ribs 9 or 10 and low, spines needle-like and 8–12: fls. white, pinkish outside, to nearly 5 in. long. Brazil, Paraguay, Argentina.

MOONFLOWER: *Calonyction.*

MOONSEED: *Menispermum.* **Carolina:** *Cocculus carolinus.*

MOONWORT: *Botrychium, Lunaria.*

MOOSEWOOD: *Acer pennsylvanicum.*

MORACEÆ. Mulberry Family. Trees, shrubs and herbs of wide distribution, some of them climbing, often having milky juice and mostly alternate simple lvs.: fls. small, unisexual, in spikes or heads, or in Ficus on the inside of a hollow receptacle and constituting a fig; perianth usually of 4 parts and stamens 4; ovary superior, 1-celled: fr. an achene or drupe. The family furnishes many economic products, as edible frs., hemp, rubber, dyes, medicines, and food for silkworms. Genera known to hort. are Antiaris, Artocarpus, Brosimum, Broussonetia, Cannabis, Castilla, Cecropia, Chlorophora, Dorstenia, Ficus, Humulus, Maclura, Morus.

The plants are of diverse utility. Fig, mulberries and breadfruit are known for the edible fruit, hemp (Cannabis) for its fiber, Castilla and some species of Ficus for rubber, Dorstenia for its curious open receptacle and sometimes grown under glass for botanical demonstration, hop (Humulus) for its cones used in brewing and grown also for ornament, osage-orange (Maclura) for hedges, and others in general planting for ornament and interest.

MOREA (*Moræa*). *Iridaceæ.* Mostly African herbs having corms or short rootstocks, narrow basal lvs. and iris-like fls. in clusters, the perianth without tube. Tender in the N.; otherwise cult. as for *Iris* which these plants much resemble. They thrive in Fla. and Calif.

bicolor. To 2 ft.: fls. lemon-yellow spotted with brown at base, 2 in. across. S. Afr.

iridioides. To 2 ft.: fls. white with yellow bands, 1½ in. long, the crests of the style marked with blue. S. Afr. Var. **Johnsonii** has longer lvs. and larger fls.

pavonia (*Iris pavonia*). To 1 or 2 ft.: fls. about 1 in. long, bright red with blue-black or green-black spot at base or in var. **lutea** yellow and var. **villosa** bright purple with blue-black; another kind is white with blue spots. S. Afr.

Robinsoniana. To 8 ft.: fls. white spotted near base with red and yellow. Lord Howe Isls., Australia.

Sisyrinchium: *Iris Sisyrinchium.*

tricuspis (*Iris tricuspis*). To 1 or 2 ft.: fls. whitish or lilac, to 1 in. long. S. Afr.

MORINA. *Dipsaceæ.* Per. thistle-like Asian herbs with opposite or whorled spiny-toothed lvs. and 5-lobed fls. in interrupted spikes, the whorls subtended by leaf-like spiny-toothed bracts; sometimes planted for ornament. Propagated by division.

longifolia. Whorl-Flower. To 4 ft.: lvs. oblong to linear, to 6 in. long: fls. white changing to crimson, 1½ in. long, tubular and conspicuously protruding. Himalayas.

MORINDA. *Rubiaceæ.* Trees and shrubs in warm and trop. regions of both hemispheres, sometimes climbing, with opposite lvs. or sometimes in 3's, and small white or crimson fls. often in close clusters: fr. a glomerate head of berry-like carpels.

citrifolia. Indian-Mulberry. Small glabrous tree: lvs. narrow-oblong to broad-oval, entire, to 10 in. long, with prominent curving side veins, the stipules large and soon falling: fls. white, ½ in. or more long: fr. an aggregate yellowish fleshy head to 2 in. long. S. E. Asia, Australia.—Yields red and yellow dye in fls. and roots.

Royoc. Royoc. Vine-like shrub or sometimes erect to 4 ft.: lvs. narrow-oblong, acute, to 3 in. or more: fls. mostly white, in a head which becomes a yellow fr. to ¾ in. and more across. Fla., W. Indies, and seen about cult. grounds.

MORINGA (*Hyperanthera*). *Moringaceæ.* Deciduous trees with alternate pinnate lvs. and white or red fls. in axillary panicles; one grown for ornament in the tropics, also for the edible root and the seeds from which ben oil is extracted. Propagated by seeds or cuttings.

oleifera (*M. pterygosperma*). Horse-Radish-Tree. To 30 ft.: lfts. small, less than 1 in. long: fls. white, 1 in. across, fragrant: fr. linear, 3-angled, to 1½ ft. long. E. Indies; nat. in trop. Amer.

pterygosperma: *M. oleifera.*

MORINGACEÆ. Moringa Family. Only one genus, Moringa, characterized by bisexual irregular fls. having 5 sepals and petals, 5 fertile and 5 sterile stamens, superior 1-celled ovary, and fr. an elongated caps.

MORNING-GLORY: *Ipomœa,* also *Argyreia, Convolvulus.*

MORONGIA: *Schrankia.*

MORUS. Mulberry. *Moraceæ.* Northern hemisphere deciduous trees with alternate lvs., unisexual fls. in drooping catkins, and fr. a juicy syncarp resembling a blackberry in appearance; grown for the edible frs. and the foliage which is used to feed silkworms. For cult. see *Mulberry.*

acidosa (*M. japonica*). To 25 ft., usually shrubby: lvs. ovate, to 6 in. long, toothed, often deeply lobed: fr. dark red, ½ in. long, sweet. China, Korea, Japan.

alba. White M. To 50 ft.: lvs. ovate, to 4 in. and more long, coarsely toothed or often lobed, shining above: fr. white, pinkish or purple, to 2 in. long, sweet. China; nat. in Eu. and N. Amer. Var. **pendula,** branches drooping. Var. **pyramidalis,** of narrow pyramidal habit. Var. **skeletoniana** (var. *laciniata*), lvs. with deep narrow lobes. Var. **tatarica** (*M. tatarica*), Russian M., is a small very hardy form.—Other names referred here are *M. cedrona, M. hispanica* and *M. Tokwa.*

cedrona: *M. alba.*

hispanica: *M. alba.*

japonica: *M. acidosa.*

multicaulis (*M. alba* var. *multicaulis*). Resembling *M. alba* and sometimes considered a var., but with much larger coarsely toothed lvs. which are dull green and rough above, and sweet black fr. China.—Famous for its part in the historic attempts at silk-raising in N. Amer.

nigra. Black M. To 30 ft.: lvs. broad-ovate, to 8 in. long, coarsely toothed, usually not lobed, heart-shaped at base, dull green and rough above, pubescent beneath: fr. purple to black, to 1 in. long. W. Asia.

rubra. Red or American M. To 60 ft.: lvs. ovate, to 5 in. or more long, sharply toothed, sometimes lobed, soft-pubescent beneath: fr. dark purple, about 1 in. long. Mass. to Fla. and Tex.

tatarica: *M. alba* var.

Tokwa: *M. alba.*

MOSCHARIA. *Compositæ.* One musky-scented ann. herb from Chile, sometimes planted for ornament. **M. pinnatifida.** To 2 ft., diffuse: lvs. clasping, pinnate or pinnatifid, the upper ones lobed only at base: heads of white or light rose ray- and disk-fls., borne in terminal panicles; pappus of scales.

MOSCHATEL FAMILY: *Adoxaceæ.*

MOSCHOSMA: *Iboza riparia.*

MOSQUITO-TRAP: *Cynanchum acuminatifolium.*

MOSS, CLUB-: *Lycopodium.* Ditch-: *Elodea canadensis.* Flowering-: *Pyxidanthera barbulata.* -Pink: *Phlox subulata.* Rose-: *Portulaca grandiflora.* Spanish-: *Tillandsia usneoides.*

MOTHER-OF-THYME: *Thymus Serpyllum.*

MOTHERWORT: *Leonurus.*

MOUNTAIN FRINGE: *Adlumia fungosa.*

MOURNING BRIDE: *Scabiosa.*

MUCRONATE: tipped with a short sharp point or mucro.

MUCUNA. *Leguminosæ.* Per. woody vines with lvs. of 3 lfts., papilionaceous fls. in axillary clusters, and thick leathery pods; distinguished from Stizolobium chiefly by characters of seed.

Deeringiana: *Stizolobium Deeringianum.*

urens. Climbing to 30 ft.: lfts. to 7 in. long: fls. purple with yellowish keel: pods to 8 in. long, covered with stinging hairs. Trop. Amer.

MUEHLENBECKIA: *Calacinum* and *Homalocladium.*

MUGWORT: *Artemisia vulgaris* and *lactiflora.*

MULBERRY. Attractive trees from many regions in the northern hemisphere, being species of Morus. Both for fruit and ornament the mulberry is planted. The tree is naturally open-centered and round-headed, and is an interesting subject; some of the varieties have finely cut leaves. The fruits are in great demand by the birds, and after they begin to ripen the small-fruits and cherry trees are often freer from robins and other fruit-eating birds. For this reason alone they may be a valuable tree for the fruit-grower or the gardener.

In orchard plantations mulberries may be placed 25 to 30 feet apart. About the borders of a place they may go closer. The Russian varieties are often planted for windbreaks, for they are very hardy and thrive under the greatest neglect; and for this purpose they may be planted 8 to 20 feet apart; they make excellent screens and stand clipping well. New American, Trowbridge and Thorburn are leading kinds of fruit-bearing mulberries for the North. The true Downing is not hardy in the northern states; but New American has been sold under this name. Pomological mulberries for planting in the North are forms of *Morus alba.* The more tender *M. nigra,* black mulberry, is grown in the middle South and beyond. Certain named fruit varieties of the native *M. rubra* are also known. In silk-producing countries mulberries are grown as forage for silkworms. Mulberries thrive in any good soil, and need no special treatment. A weeping mulberry is frequent as an ornamental oddity, being grafted 4 or 5 feet high on a straight tree form; it is *Morus alba.*

Mulberries grow readily from seeds. Named kinds may be cion-budded on seedlings or on stocks grown from ripe hardwood cuttings.

MULBERRY, FRENCH-: *Callicarpa americana.* Indian-: *Morinda citrifolia.* Paper-: *Broussonetia.*

MULGA: *Acacia aneura.*

MULGEDIUM: *Lactuca.*

MULLEIN: *Verbascum.* Cretan: *Celsia cretica.*

MULTIFID: cut or cleft into many narrow lobes or parts.

MUNDI-ROOT: *Chlorocodon Whiteii.*

MURRÆA (or *Murraya. Chalcas*). *Rutaceæ.* A few Indo-Malayan spineless small trees or shrubs, one of which, **M. exotica,** the Orange-Jessamine, is a handsome evergreen grown for ornament in S. Fla. and S. Calif. and the tropics; the plant known as *M. paniculata* is probably a form of it. The orange-jessamine makes a tree-like specimen 10–12 ft. high with glossy foliage and white very fragrant fls. succeeded by clusters of red ovoid frs. ½ in. or less in diam.: lvs. pinnate, of 7–9 ovate or rhomboidal lfts. and marginless petioles; blooms several times a year.

MUSA. Banana. *Musaceæ.* Tree-like plants, the large spirally arranged lvs. (which become frayed by the wind) forming a trunk by their sheathing bases, the irregular fls. borne in clusters under colored bracts on long drooping or erect spikes, each st. or trunk blooming only once, and fr. long and fleshy; grown for the edible frs. and a few for fiber and ornament. See *Banana.*

Bananas are suited only to warm climates, although they often withstand a few degrees of frost. For ornament they are grown in mild climates and are often planted out for subtropical effects. The plant is renewed by the suckers that spring up at the base, as the top dies after fruiting or becomes weak and unsightly. Propagation is also effected by root-cuttings planted in warm beds and transplanted as soon as one or two leaves have matured. The ornamental kinds often produce seeds and these should be sown in beds with bottom heat. Bananas may be grown for decoration in greenhouses with a night temperature of about 65°.

Arnoldiana. To 15 ft.: lvs. to 7 ft. long: spikes short and drooping: fr. to 4 in. long, with seeds ½ in. long. Trop. Afr.

Cavendishii. Dwarf B. To 6 ft., stoloniferous: lvs. to 4 ft. long and 2 ft. wide: spike short and drooping, the reddish-brown bracts to 6 in. long: fr. yellow, to 5 in. long, seedless. S. China.

Ensete. Abyssinian B. To 40 ft., the trunk swollen at base: lvs. to 20 ft. long and 3 ft. wide: spike erect, the reddish-brown bracts to 1 ft. long: fr. to 3 in. long, having large black seeds, inedible. Abyssinia.

paradisiaca. PLANTAIN. To 30 ft., stoloniferous; lvs. to 9 ft. long and 2 ft. wide: spike drooping, to 5 ft. long, the red or violet bracts to 1 ft. long: fr. greenish-yellow, to 14 in. long, seedless, edible when cooked. Probably India. Var. **sapientum,** COMMON B., has yellow fr. which is edible without cooking. Races are **rubra** with red frs. and **Champa** with thin-skinned "lady-finger" frs.

rosacea. To 6 ft., stoloniferous: lvs. to 3 ft. long and 1 ft. wide, purplish beneath: spike drooping, to 1 ft. long, the pale blue bracts to 8 in. long: fr. yellowish-green, to 3 in. long, inedible. India.

sumatrana. To 8 ft., usually stoloniferous: lvs. to 6 ft. long and 1½ ft. wide, glaucous beneath: spikes drooping: fr. to 3 in. long, inedible. Sumatra.

textilis. ABACÁ. MANILA HEMP. To 20 ft., stoloniferous: lvs. oblong with petiole 1 ft. or more long: spike drooping and short: fr. to 3 in. long, with numerous black seeds, inedible. Philippine Isls.—Grown for the fiber in the lf.-bases.

zebrina: botanical identity uncertain: lvs. striped with brown.

MUSACEÆ. BANANA FAMILY. Trop. per. monocotyledonous herbs of about 6 genera, often of very large size and becoming woody and somewhat tree-like. The family is characterized by the bisexual or monœcious fls. borne in the axils of large bracts in a spicate or paniculate infl. which is subtended by spathes, with 3 sepals and 3 petals, 6 stamens 5 of which are fertile, inferior 3-celled ovary, and fr. a berry or caps. Several genera are cult. for ornament and other kinds for fiber and the edible fr., as Heliconia, Musa, Ravenala, and Strelitzia.

MUSCADINIA: *Vitis Munsoniana* and *rotundifolia.*

MUSCARI. GRAPE-HYACINTH. *Liliaceæ.* Small spring-blooming bulbous herbs native in Medit. region, having a few narrow basal lvs. and small blue or white urn-shaped nodding fls. in racemes or spikes at top of scape, the perianth-segms. united and having 6 small recurved teeth. Of easy cult., as for hyacinths, and useful for colonizing. Propagated by offsets or seeds.

amethystinum: an unidentified trade name.

azureum: *Hyacinthus azureus.*

botryoides. To 1 ft.: lvs. ⅛ in. across: fls. blue, about ⅛ in. long. S. Eu. Var. **album** has white fls., **carneum** flesh-colored, and **cæruleum** bright blue.

commutatum. To 10 in.: lvs. 1/6 in. across: fls. dark blue. Sicily.

comosum. To 1 ft.: lvs. to 1 in. across: upper fls. sterile, blue or violet, lower fertile fls. olive. S. Eu., Asia. Var. **monstrosum** (*M. plumosum*) has all the fls. sterile and cut into fine shreds.

conicum. To 6 in.: lvs. ¼ in. across: fls. violet-blue. S. Eu.

Heldreichii. To 8 in.: lvs. 1/12 in. wide: fls. amethyst-blue, the teeth white. Greece.

Masseyanum: listed name; plant with rose-colored fls.

monstrosum: *M. comosum* var.

moschatum. To 10 in. or less: lvs. to ¾ in. across: fls. musk-scented, purplish becoming yellowish or brownish. Asia Minor.

neglectum. To 9 in.: lvs. 1/6 in. wide: fls. dark blue, fragrant. Medit. region.

paradoxum. To 9 in.: lvs. few, to ¾ in. broad: fls. blue-black, in dense racemes. Caucasus.

plumosum: *M. comosum* var. *monstrosum.*

racemosum. To 8 in.: lvs. 1/12 in. wide: fls. dark blue, fragrant. Eu., Asia.

MUSCARIA: *Saxifraga cæspitosa.*

MUSHROOM. The common cultivated mushroom is one of the higher fungi, *Agaricus campestris.* It is grown from spawn, which is mycelium or vegetative filaments temporarily dried or partially dried and which resume growth under proper conditions. Formerly the mycelium was available only in "bricks" of prepared material and this is yet on the market and considerably used. The commercial growers and many others now use a spawn prepared in sterile bottles and sold therein or sometimes removed, dried, and packed in cartons. The requisite conditions for mushroom growing are a special soil mixture, controlled temperature and moisture, absence of other fungous growths. Such conditions are usually obtained in cellars, protected cool sheds, and similar places where darkness can be maintained. When the soil and beds are ready, the spawn is broken into small pieces and planted.

Soil is made from a compost of stable manure. Some growers add a small proportion of good garden earth. Fresh manure is piled and wet and allowed to ferment, being turned several times and mixed. The fermentation brings the compost into uniformity and develops a standard condition, and prevents the growth of mold fungi. The period of fermentation usually requires twenty-one to thirty-five days; the temperature then falls, and the mass loses its odor and becomes adhesive. It is then placed 6–8 inches deep in a bed. The width of the bed is regulated by convenience; one should be able to reach across it from one side or both sides. The length of course is governed by the quantity of mushrooms desired and the available space. Usually in this country the beds are flat, but they may be ridged or rounded if desired. The soil or compost should be firmed in the bed, but not rammed down. Sometimes beds are placed one above the other in the mushroom house, on shelves or in tiers. Air temperature of the mushroom house for optimum results may be as warm as the beds at first, but after production begins it should be maintained as nearly as possible at 56–58° F., not rising above 60° for any length of time; temperature below 50° is not injurious except that the crop is delayed.

Planting in these prepared beds may begin when the temperature of the compost is not higher than 75° F. and not lower than 60°. The bottle of spawn is cracked off, the spawn cake broken into about forty pieces, and one of the pieces should be planted for each square foot. The piece is firmly pressed into the compost 1 or 2 inches deep. Brick spawn is usually broken into pieces about 2 inches square and planted 9 or 10 inches apart either way. In about three weeks the growth of the spawn will have spread out considerably from the pieces; the bed is then smoothed or firmed but the surface is sprinkled only if very dry; the beds then receive a covering or casing of good garden soil to the depth of 1 or 1½ inch; and one waits for the appearing of the mushrooms which should be in six or seven weeks, the soil being thoroughly moistened in six weeks to bring on the mushrooms for which the bed should then be ready. The bed should continue to produce a crop for two or three months.

The moisture factor of soil and air is of prime importance. The soil should be moist but not soaked, so that when held firmly in the hand no drops of water will come from it. The final surface of the beds must be sprinkled as often as it becomes dry. The roofs or ceiling should not drip, but on the other hand they should not be dry and dusty; if too dry, they should be moistened with a fine spray. The air should have a humidity content of 70 to 75 per cent.

The ventilation and sanitation must be looked after. The air should not become stagnant or the cellar stuffy. All dead and waste mushrooms are to be removed; the old bottoms of clusters remaining after picking are to be lifted out and the places filled with earth. Insects are to be trapped. The place should be sweet and clean.

The lawn may be used as a mushroom bed, pieces of spawn being set in it in holes. It is not likely that conditions will be right every year for a crop, but mushrooms are often produced in autumn if land is porous and fertile.

MUSKMELON: see *Melon.*

MUSK-PLANT: *Mimulus moschatus.*

MUSK-ROOT: *Adoxa Moschatellina.*

MUSQUASH-ROOT: *Cicuta maculata.*

MUSTARD. Several species of Brassica (Sinapis), mostly annuals, grown for the cluster of basal leaves used as greens, and also for the seeds employed in the manufacture of table mustard and in other countries for oil (colza). They are half-hardy, coming quickly from seeds. For greens the plants are usually in rows far enough apart to admit of tool-tillage; in the row they may stand 5 or 6 inches apart and be thinned as used. They may be sown at intervals, in early spring for early summer use up to August or even later for autumn use; in warm countries they are sown in autumn for early spring crop. They are usually little attacked by fungi. If allowed to seed, they may become weedy.

The commonest vegetable-garden species is *Brassica juncea*, particularly var. *crispifolia* in the kinds known as Ostrich Plume and Southern Curled. Another race is represented by *B. chinensis*, *B. parachinensis* and *B. pekinensis*, the latter discussed under the entry *Pe-Tsai*. Probably all these mustards are east-Asian in nativity.

MUTISIA. *Compositæ.* S. American herbs or shrubs with alternate lvs. and solitary terminal heads of disk-fls. and a few purple, rose or yellow ray-fls.; pappus plumose. One species grown out-of-doors in Calif. or in a cool greenhouse. Propagated by cuttings.

Clematis. Pubescent climbing herb: lvs. pinnate, with 4–5 pairs of oblong-lanceolate entire lfts., the midrib extended into a tendril: heads 2 in. across, with 9–10 bright red recurved rays. Trop. Andes.

MYALL, WEEPING: *Acacia pendula.*

MYOPORACEÆ. MYOPORUM FAMILY. Trees and shrubs of 5 genera native from Australia, E. Asia to Hawaii and W. Indies: lvs. mostly alternate, simple and entire: fls. bisexual, with 5-parted calyx, gamopetalous 5–6-lobed corolla, 4 stamens and 1 staminode, and superior usually 2-celled ovary: fr. a drupe. Bontia and Myoporum are occasionally grown for ornament in warm regions or greenhouses.

MYOPORUM. *Myoporaceæ.* Shrubs or trees with alternate glandular long and narrow lvs. and usually white bell-shaped fls., regular or essentially so, in axillary clusters among the foliage, and small drupaceous frs.; native from Japan to Australia and grown in the open in warm regions and under glass N. Propagated by cuttings.

acuminatum. Shrub: lvs. oval-oblong to linear, to 3 in. long: fls. white, ⅓ in. long. Australia.

lætum. Shrub or tree to 15 ft.: lvs. lanceolate, to 4 in. long, shining: fls. white spotted purple, ⅔ in. across: fr. reddish-purple. New Zeal.

sandwicense. BASTARD SANDALWOOD. NAIO. Tree to 60 ft. with wood odor of sandalwood: lvs. oval-lanceolate, to 6 in. long: fls. white or pink, ⅓ in. across: fr. white. Hawaiian Isls.

MYOSOTIDIUM. *Boraginaceæ.* One per. herb native in the Chatham Isls. (New Zeal.), sometimes cult. in mild climates; it has been referred to Cynoglossum. Propagated by seeds. **M. hortensia** (*M. nobile*). To 3 ft.: basal lvs. ovate, heart-shaped at base, to 1 ft. long, st. -lvs. smaller: fls. dark blue, paler at outside, ½ in. across, in dense cymes to 6 in. across.

MYOSOTIS. FORGET-ME-NOT. *Boraginaceæ.* Ann., bien. and per. low herbs with alternate entire lvs. and small but abundant blue, rose or white fls. in terminal racemes, largely in Amer. and Eu. in moist or cool places; corolla salverform, throat usually crested; stamens included.

Forget-me-nots are cultivated mostly out-of-doors and thrive in partially shady positions in moist soil. Winter protection is desirable. Propagated by seeds which will give bloom in autumn or the second year; also by division of the clumps.

alpestris: the plant grown under this name is a form of *M. sylvatica.* The true species grows to 8 in. high and has shorter-stalked fls.

alpina: referred to *M. sylvatica.*

arvensis. Ann. or bien. to 1½ ft.: lvs. oblong or oblong-lanceolate, 1 in. long: fls. white or blue, to 1/6 in. across. Eu., Asia, E. N. Amer.

azorica. Per. to 1½ ft.: lvs. broadly oblong-lanceolate, to 4 in. long: fls. blue with whitish center, ¼ in. across. Azores, Canaries, Algeria.

cespitosa. Similar to *M. laxa* but more pubescent and fls. longer pedicelled. Eu.

dissitiflora: the plant known to hort. under this name is a form of *M. sylvatica.* The true species grows only to 8 in. high.

laxa. Per. with decumbent sts. to 1½ ft. long: lvs. oblong or spatulate: fls. blue with yellow center, 1/6 in. across. Newf. to Va. and Tenn., Eu.

lithospermifolia: a form of *M. sylvatica* with numerous large lvs.

palustris: *M. scorpioides.*

robusta grandiflora: a form of *M. sylvatica.*

rosea: a variant of *M. sylvatica.*

rupicola: synonym of the true *M. alpestris.*

scorpioides (*M. palustris*). Sts. decumbent, to 1½ ft. long: lvs. oblong-lanceolate: fls. bright blue with yellow, pink or white center, ¼ in. across. Eu., Asia. Var. **semperflorens** is a dwarf form to 8 in. high which flowers all summer.

sylvatica. Ann. or bien. to 2 ft.: lvs. oblong-linear: fls. blue with yellow center, varying to pink or white, to ⅓ in. across. Eu., Asia.

Welwitschii. Ann. or bien. to 4 in.: lvs. ovate-lanceolate: fls. bright blue with yellowish-white center. Spain.

MYRCIARIA: *Eugenia.*

MYRICA. *Myricaceæ.* Shrubs or tree-like, with alternate simple lvs., unisexual fls. in catkins, and grayish or purple drupaceous frs.; native in the northern hemisphere. Cult. for ornament or *M. rubra* for the edible frs. Propagated by seeds, layers and suckers.

asplenifolia: *Comptonia asplenifolia.*

californica. CALIFORNIA BAYBERRY. To 35 ft.: lvs. evergreen, lanceolate, to 4 in. long: fr. purple. Wash. to Calif.; not hardy N. E.—Will grow on sterile sandy soils.

caroliniensis. BAYBERRY. To 9 ft.: lvs. deciduous or sometimes evergreen, obovate, to 4 in. long, acutish or obtuse: fr. grayish-white. N. S. to Fla. and Ala.; hardy N.—Will do well on poor soil.

cerifera. WAX-MYRTLE. To 35 ft.: lvs. evergreen, lanceolate, to 3 in. long, acute: fr. grayish-white. N. J. to Fla. and Tex.; fairly hardy N.—Prefers moist peaty soil.

Gale. SWEET GALE. To 5 ft.: lvs. deciduous, oblanceolate, to 2½ in. long: fr. inclosed by 2 wing-like bracts, yellowish, in dense catkins ¼ in. or more long. N. Amer., Eu., Asia; hardy N.—Does best on moist peaty soil.

rubra. To 15 ft.: lvs. oblong-lanceolate, to 5 in. long: fr. deep red-purple. China, Japan; hardy only in warm regions.—The frs. are edible and also used for making a drink.

MYRICACEÆ. SWEET GALE FAMILY. Two genera of small trees or shrubs native in the northern hemisphere, Comptonia and Myrica, with alternate simple or pinnatifid lvs., unisexual fls. without perianth, having 2–16 stamens, 1-celled ovary, and fr. a small drupe or nut.

MYRICARIA. FALSE TAMARISK. *Tamaricaceæ.* Deciduous woody plants, Eu. to China, with heath-like or scale-like closely placed alternate lvs., distinguished from Tamarix on technical characters of fls. and seeds: fls. small, in dense racemes, pink or white.

germanica. To 6 ft., with many close ascending branches: fls. in terminal bracted racemes to 2 in. long. S. Eu., W. Asia; hardy N.

MYRIOCEPHALUS. *Compositæ.* Australian herbs, usually white-woolly, with alternate entire lvs. and tubular fls. in dense compound heads surrounded by a general involucre, the bracts often with conspicuous appendage; pappus none or of awns or bristles. One species sometimes grown as an everlasting.

Stuartii (*Polycalymma Stuartii*). Ann. to 2 ft.: lvs. linear or lanceolate, to 2 in. long: fls. yellow, the bracts tipped white and resembling rays, in clusters 1 in. or more across.

MYRIOPHYLLUM. WATER MILFOIL. *Haloragidaceæ.* Aquatic herbs, the lvs. often of two kinds, those above the water entire or toothed and the submerged lvs. pinnatifid into hair-like segms., and the fls. in axillary clusters or spikes; grown in aquaria and ponds. Propagated by long cuttings planted in mud. Several species are native in the U. S., and they may occasionally be transferred to aquaria or pools.

proserpinacoides. PARROTS-FEATHER. WATER-FEATHER. Rising about 6 in. out of water: lvs. feathery, all of one kind, the herbage in long bright green strands: fls. diœcious. Chile, Uruguay.—Now commonly grown in fountain basins and similar places.

verticillatum. Lvs. of two kinds; submerged lvs. in whorls of 3 or 4 and very finely divided; floral lvs. pinnatifid. N. N. Amer., Eu., Asia.

MYRISTICA: see *Nutmeg.*

MYRISTICACEÆ. NUTMEG FAMILY. Trop. evergreen diœcious trees of 8 genera, having alternate entire lvs., small fls. without corolla, with 2–30 stamens, superior 1-celled ovary, and fleshy fr. containing 1 seed surrounded by an aril. The genus Myristica furnishes the nutmeg and mace of commerce.

MYROBALAN: *Phyllanthus Emblica, Terminalia Catappa;* also *Prunus cerasifera.*

MYROSPERMUM. *Leguminosæ.* One tree to 60 ft., native in S. Amer. and escaped in W. Indies. **M. frutescens.** Lvs. of 11–17 oblong or oval lfts. to 1 in. long: fls. papilionaceous, white, ½ in. long, in racemes to 4 in. long: pod flat, to 3 in. long, winged.

MYROXYLON (*Toluifera*). *Leguminosæ.* Trees with pinnate lvs., whitish papilionaceous fls. in racemes, and flattened 2-winged pods bearing 1 seed in the end; native of trop. Amer. where they are grown for the balsam which they yield.

Pereiræ. BALSAM-OF-PERU. To 50 ft.: lfts. 7–11, oblong. Mex. to N. S. Amer.

peruiferum. PERU BALSAM-TREE. Large tree: lfts. 9–13, ovate. N. S. Amer.

toluiferum (*T. Balsamum*). TOLU BALSAM-TREE. To 100 ft.: lfts. 7–11, oblong. N. S. Amer.

MYRRHINIUM. *Myrtaceæ.* Shrubs or trees of S. Amer. with opposite simple lvs. and fls. in corymbs, having 4–8 long-exserted stamens; one species intro. in S. Calif.

salicinum. Medium-sized glabrous tree: lvs. narrow oblong-lanceolate, gradually contracted at base. Uruguay.

MYRRHIS. MYRRH. *Umbelliferæ.* A European per. herb is sometimes grown for the sweet-scented herbage. **M. odorata.** SWEET CICELY of Eu. To 3 ft.: lvs. 2–3-pinnately compound into lanceolate, toothed or cut segms.: fls. small, whitish, in compound umbels: fr. shining, nearly 1 in. long and strongly ribbed.—Propagated by seeds sown as soon as ripe, or by division.

MYRSINACEÆ. MYRSINE FAMILY. Trees and shrubs of about 30 genera in the tropics and subtropics on both sides of the world, with alternate simple lvs., regular bisexual or rarely diœcious fls. having 4–5 sepals, 4–5-

lobed corolla, 5 stamens, mostly superior 1-celled ovary, and fr. a berry or drupe. Ardisia, Mæsa, Myrsine and Suttonia are grown for ornament.

MYRSINE. *Myrsinaceæ.* Shrubs or trees native in Asia and Afr., having entire or toothed lvs., small fls. with petals united at base or to middle, and fr. a 1-seeded berry; grown out-of-doors in warm climates.

africana. Shrub to 4 ft. or sometimes small tree: lvs. elliptic, variable but usually about ½ in. long, finely toothed beyond middle: fls. 1/24 in. across, in 3–8-fld. clusters. Afr., Arabia to Cent. China.

salicina: *Suttonia salicina.*

semiserrata. Small tree; lvs. lanceolate, to 4 in. long, toothed or nearly entire: fls. white, about 1/12 in. long, in 5–12-fld. clusters. Himalayas to China.

Urvillei: *Suttonia australis.*

variabilis. Tree to 40 ft.: lvs. obovate-oblong, to 2½ in. and more long, entire or slightly toothed: fls. about 12 in. long. Australia.

MYRSIPHYLLUM: *Asparagus asparagoides.*

MYRTACEÆ. MYRTLE FAMILY. An important family with aromatic qualities, in the tropics and semi-tropics of both hemispheres, particularly strong in Australia, of about 75 genera, largely evergreen, yielding valuable timber, economic products such as oils, gums, cloves, allspice, and many edible frs., as well as numerous ornamental subjects. Trees and shrubs with simple mostly opposite lvs., regular bisexual polypetalous fls. having usually 4–5 sepals and petals or petals lacking, numerous stamens and inferior 1- to many-celled ovary. Genera known to hort. are: Agonis, Angophora, Astartea, Balaustion, Beaufortia, Callistemon, Calothamnus, Calytrix, Chamælaucium, Darwinia, Eremæa, Eucalyptus, Eugenia, Feijoa, Hypocalymma, Kunzea, Leptospermum, Melaleuca, Metrosideros, Myrrhinium, Myrtus, Pimenta, Psidium, Rhodomyrtus, Syncarpia, Tristania, Verticordia.

MYRTILLOCACTUS. *Cactaceæ.* Large short-trunked tree-like spiny cacti of Mex. and Guatemala, making thick-branched erect tops, with few stout ribs: fls. diurnal, very small, often several at an areole; ovary bearing a few very small scales with wool in the axils. See *Cacti.*

geometrizans (*Cereus geometrizans*). Top large and much branched, to 15 ft., branches bluish-green and commonly 5- or 6-ribbed and to 4 in. thick, radials mostly 5, central 1 and dagger-shaped: fls. mostly 1 in. or more broad: fr. (garrambulla) size of olive, bluish or purplish, edible. Tablelands, Cent. and S. Mex.

MYRTLE: *Myrtus.* Crape-: *Lagerstrœmia.* Downy-: *Rhodomyrtus tomentosa.* Gum-: *Angophora.* Running-: *Vinca minor.* Sand-: *Leiophyllum.* Wax-: *Myrica cerifera.*

MYRTUS. MYRTLE. *Myrtaceæ.* Trop. and extra-trop. shrubs and trees in both hemispheres, with opposite entire lvs., white or rosy fls. solitary or in cymes, and fr. a berry.

Myrtle is grown out-of-doors in the South, in greenhouses or in pots for lawn specimens in the North. Propagated by cuttings of partially ripened wood under glass; also by seed.

bullata. To 25 ft.: lvs. broad-ovate, to 2 in. long, leathery, blistered between veins: fls. ½ in. across: fr. dark red, ⅓ in. long. New Zeal.

communis. The classic MYRTLE. To 10 ft., evergreen, strongly scented: lvs. ovate to lanceolate, to 2 in. long: fls. to ¾ in. across: fr. bluish-black, ½ in. long. Medit. region. Var. **italica,** lvs. small, sharp-pointed. Var. **microphylla** has small overlapping lvs. Var. **romana,** lvs. broad-ovate. Var. **tarentina,** lvs. in 4 rows, short. Var. **variegata,** lvs. variegated.

Luma: *Eugenia apiculata.*

obcordata. To 15 ft., much branched: lvs. obcordate, to ½ in. long, leathery: fls. ¼ in. across: fr. dark red or violet, ¼ in. long. New Zeal.

pedunculata. Similar to *M. obcordata* but differing in the obovate lvs. rounded at the tip and 5- rather than 4-lobed calyx. New Zeal.

Ralphii. To 15 ft.: lvs. ovate, to 1 in. long: fls. ½ in. or less across: fr. dark red, to ⅓ in. long. New Zeal.

Ugni (*Eugenia Ugni*). CHILEAN GUAVA. Shrub or tree, pubescent when young: lvs. ovate, leathery, shining above, whitish beneath: fls. tinted rose, with 2 persistent basal bracts, calyx-lobes reflexed: fr. purple or reddish, about ½ in. diam. Chile.

MYSTACIDIUM. *Orchidaceæ.* African epiphytic orchids resembling Angræcum: sepals and petals similar, lip entire or 3-lobed, spurred at base. See *Orchids.*

distichum (*Angræcum distichum*). Sts. to 5 in. long, thickly covered with fleshy lvs. ½ in. or less long: fls. white, about ½ in. long, solitary, the spur about ¼ in. long, Aug.–Nov. Trop. Afr.

N

NABALUS: *Prenanthes.*

NÆGELIA. *Gesneriaceæ.* Trop. American herbs with opposite soft usually cordate lvs., tubular red or yellowish-white fls. in terminal panicles, and capsular frs.; grown in a warm greenhouse as for gloxinias and others. Propagated by stolons or offsets.

cinnabarina (*Gesneria cinnabarina*). To 2 ft., hairy: lvs. with red or purplish hairs: fls. cinnabar-red spotted with white, 1½ in. long, drooping, the tube swollen to base. Mex.

multiflora (*Gesneria amabilis*). To 1½ ft.: lvs. hairy: fls. white or cream, drooping, tube scarcely swollen. Mex.

zebrina (*Gesneria zebrina*). To 2 ft., densely pubescent: lvs. marked along veins with purple-red or dark brown: fls. red, yellow spotted red beneath, 1½ in. long, tube contracted at base. Brazil.

NAIBEL: *Hesperethusa crenulata.*

NAIL-WORT: *Paronychia.*

NAIO: *Myoporum sandwicense.*

NANANTHUS. *Aizoaceæ.* One of the many recent segregates from the old genus Mesembryanthemum (which see): stemless very dwarf per. plants with thick rootstock and dotted lvs. in tufts of 3–6 pairs together not separated by internodes: fls. sessile or nearly so; stamens erect and conspicuous, in a cone.

aloides (*M. aloides*). Nearly or quite stemless, tufted: lvs. 6–8, partially terete, 2 in. long and ⅓ in. broad at base, white-dotted: fls. yellow, sessile, 1 in. across, the petals in a single series. S. Afr.

vittatus (*Aloinopsis vittata*) from S. Afr., is planted in Calif.: low and closely cespitose: lvs. short, obtusely triangular, gray-green and granular: fls. pinkish-yellow, somewhat striped; stamens in a cone.—N. *transvaalensis* is a metamorphosis of this species.

NANDINA. *Berberidaceæ.* One attractive evergreen shrub native in China and Japan, and grown out-of-doors in S. U. S. **N. domestica.** To 8 ft.: lvs. 2–3-pinnate, lfts. narrow, to 2 in. long, turning red in fall: fls. white, small, in panicles to 1 ft. long: berries bright red, ¼ in. across.—It thrives in shady or sunny positions but should be well watered; adaptable for full growth to southern parts of the country but root-hardy N. in protected places. Propagated by seeds.

NANNORRHOPS. *Palmaceæ.* Three species in N. India and 1 of them also in the Afghanistan region, small cespitose polygamous fan-palms with prostrate branching sts. and infl. among the foliage, unarmed but with serrulate petiole: lvs. rigid, plicate, with short petiole and curved bifid segms.: spadix much branched; stamens about 9 in the staminate fls. and 6 in the hermaphrodite ones: fr. a small globose or oblong 1-seeded drupe.

Ritchieana (*Chamærops Ritchieana*). MAZARI PALM. Lvs. grayish or whitish, commonly tufted from slender underground sts. or rhizomes but sometimes from erect branching st. to 10 or 20 ft. high; segms. 8–15 and a ft. or more long, long-pointed, extending to middle of blade or lower: fr. ¾ in. or less diam., surface somewhat wrinkled. Punjab, Afghanistan, Baluchistan, in arid and cold regions; has been planted in S. Calif. and in Fla.

NANNY-BERRY: *Viburnum Lentago.*

NARCISSUS. *Amaryllidaceæ.* Popular spring-flowering bulbous plants with basal lvs. and yellow or white fls. solitary or several at top of scape, the perianth salverform and having a crown or corona which may be long and tubular or short and ring-like.

Narcissi are hardy out-of-doors and also forced in the greenhouse for winter and spring bloom; favorites for colonizing. Bulbs should be planted in September or October in good loamy soil, and they will bloom the following spring if of flowering size. They do better if lifted every few years and separated, the poor bulbs discarded. A few kinds, as *N. Tazetta*, may be grown in the house without soil, merely putting the bulbs in a bowl of water and propping them up with stones. There are many choice variants and hybrids, prized by fanciers. See *Bulbs.*

Ajax: a garden group belonging to *N. Pseudo-Narcissus.*

Barrii: a hort. group intermediate between *N. incomparabilis* and *N. poeticus*, the solitary yellow fls. having a crenulate crown about one-third as long as segms.

biflorus. PRIMROSE PEERLESS N. Lvs. to 2 ft. long and ½ in. broad: fls. usually 2, white, the tube 1 in. long, the pale yellow wavy-edged crown several times shorter than segms. France to Tyrol.

Bulbocodium. PETTICOAT DAFFODIL. Lvs. to 15 in. long, very slender, exceeding the fls.: fls. solitary, bright yellow, the crown to 1 in. long and surpassing the very narrow segms. S. France to Morocco. Var. **citrinus** has lemon-yellow fls. to 2 in. long. Var. **conspicuus** is a large form. Var. **Graellsii** has whitish or primrose-yellow fls. Var. **monophyllus** (*N. Clusii*) has sessile white fls.

Burbidgei. Probably hybrid between *N. incomparabilis* and *N. poeticus:* fls. solitary, drooping, white, with very short yellow crown with red rim.

Campernelli: *N. odorus.*

Clusii: *N. Bulbocodium* var. *monophyllus.*

cyclamineus. Fls. solitary, drooping, with very short tube and lemon-yellow reflexed segms., the orange-yellow wavy-edged crown as long as segms. Portugal.

incomparabilis. Lvs. 1 ft. long and ¼ in. wide: fls. solitary, yellow, with tube ¾ in. long and wavy-edged crown about half as long as segms. Spain to Tyrol. In var. **albus** the segms. are white. There are double-fld. forms.

Jonquilla. JONQUIL. Lvs. to 1½ ft. long, narrow and rush-like: fls. 2–6 together, yellow, fragrant, with tube 1 in. long and wavy-edged crown much less than half as long as segms. S. Eu., Algeria.

juncifolius. Lvs. to 6 in. long, narrow and rush-like: fls. 1–4 together, bright yellow, with tube ½ in. long and darker yellow wavy-edged crown about half length of segms. S. France, Spain, Portugal.

Leedsii: a hort. group intermediate between *N. Pseudo-Narcissus* and *N. poeticus* with solitary whitish fls. having a yellow wavy-edged crown nearly as long as segms.

Nelsoni. Robust: fls. solitary, white with short tube and lemon-yellow crown more than half as long as segms. Probably hybrid.

odorus (*N. Campernelli*). Campernelle Jonquil. Lvs. about 1 ft. long and very narrow: fls. 2–4 together, bright yellow, fragrant, with tube ¾ in. long and crenate-lobed crown about half length of segms. France and Spain eastward. Var. **rugulosus** has shorter imbricated segms.

orientalis: *N. Tazetta* var.

ornatus: *N. poeticus* var.

poetaz. Poetaz N. Hybrid between *N. Tazetta* and *N. poeticus* var. *ornatus*, having 2–6 fls. larger and more pleasantly fragrant than *Tazetta*.

poeticus. Poets N. Lvs. to 1½ ft. long and ¼ in. wide: fls. mostly solitary, white, very fragrant, with tube 1 in. long and shallow crown with wavy red edges much shorter than segms. France to Greece. Var. **ornatus** is an early-flowering form. Var. **radiiflorus** has narrower lvs. and segms. and a more erect crown.

Pseudo-Narcissus. Daffodil. Trumpet N. Lvs. to 15 in. long and ¾ in. wide: fls. solitary, yellow, with tube ½ in. long and frilled crown about length of segms. or 2 in., sometimes double. Eu.—Here belong the Ajax and the Bicolor narcissi, the latter with segms. and crown of different shades.

recurvus: form of *N. poeticus* with recurved lvs. and segms.

rugulosus: *N. odorus* var.

Tazetta. Polyanthus N. Lvs. to 1½ ft. long and ¾ in. wide: fls. usually 4–8 together, white, fragrant, with tube to 1 in. long and light yellow crown much shorter than segms. Canary Isls. to Japan.—A pure white-fld. kind is the Paper White narcissus, favorite with florists for winter bloom, capable of being brought into flower before Christmas. Var. **orientalis**, Chinese Sacred-Lily, has sulfur-yellow segms. and dark yellow crown about one-third their length; much grown in water as a house plant.

triandrus. Lvs. about 1 ft. long, narrow and rush-like: fls. 1–6 together, pure white, with tube to ¾ in. long and entire cup-like crown half the length of segms. Spain, Portugal. Var. **calathinus** has pale yellow fls. with crown nearly as long as segms.

NASTURTIUM. *Cruciferæ.* A name of very confused application because of the indefinite and varying practices of early authors. The horticultural plant involved is the water-cress: see *Cress*. As a vernacular name, Nasturtium is applied to Tropæolum. See also *Armoracia*.

NAVARRETIA. *Polemoniaceæ.* N. American annuals with alternate pinnatifid stiff linear lvs. and blue, white or yellow salverform fls. in bracted heads; rarely grown in the flower-garden; sometimes referred to the genus Gilia.

squarrosa (*Gilia squarrosa*). Skunkweed. To 1 ft.: lvs. to 1½ in. long: fls. blue, ½ in. long, the calyx-lobes spine-tipped. B. C. to Calif.

NAVELSEED: *Omphalodes.*

NAVELWORT: *Omphalodes, Cotyledon Umbilicus.*

NECKLACE-TREE: *Ormosia.*

NECTARINE, a smooth-fruited peach. Usually nectarines are of smaller size than peaches and of richer quality, but there are no essential differences. The trees are the same. One may originate from the other, reciprocally, by seed and by bud-variation. Cultural requirements and propagation are the same. Nectarines are infrequently planted in this country, being known mostly as oddities or rarities.

NEGUNDO: *Acer.*

NEILLIA. *Rosaceæ.* Deciduous Asian spirea-like shrubs with alternate toothed often lobed lvs. and white or pink fls. in terminal racemes or panicles. Attractive bushes, hardy N. or in the north central states. Propagated by greenwood cuttings under glass and by seeds.

affinis. To 6 ft.: fls. pink, campanulate, in dense racemes to 3 in. long, calyx pubescent, May–June. China.

longiracemosa. To 10 ft.: fls. pink, tubular, in dense racemes 3 in. and more long, calyx pubescent, June–July. China.

sinensis. To 6 ft.: fls. pinkish, tubular, in nodding racemes to 2 in. long, calyx glabrous, May–June. China.

thibetica. To 6 ft.: fls. pink, tubular, in dense racemes to 3 in. long, calyx pubescent. China.—Closely allied to *N. longeracemosa* but lvs. and ovary more pubescent.

thyrsiflora. To 4 ft.: fls. white, campanulate, in panicled racemes, calyx pubescent, Aug.–Sept. Himalayas.

NELUMBIUM (*Nelumbo*). Lotus. *Nymphæaceæ* (or *Nelumbonaceæ*). Strong large aquatic plants with shield-like lvs. usually standing above the water, single large fls. mostly overtopping the lvs., and large flat-topped fr.-receptacles containing many carpels, each opening on top by a large hole; suitable for large ponds and for masses, sometimes colonized.

The roots of nelumbiums should not be allowed to freeze. Increased by seed, sown in shallow pans in the garden or if sown in ponds they are rolled in a ball of clay and dropped in the water; the hard seeds of some species germinate better if they are bored or filed. Propagated also by sections of the rhizomes, covered with a foot or two of water, if outdoors; *N. Nelumbo* may be increased by division. The tubers or roots should not be transplanted until good growth has begun.

flavescens: a hort. form, probably of *N. luteum.*

luteum. American L. Water Chinkapin. Lvs. usually 1–2 ft. above the surface in shallow water, cup-shaped, 1–2 ft. across: fls. pale yellow, to 10 in. across. S. Ont. to Fla. and La.

Nelumbo (*N. speciosum. Nelumbo nucifera* and *indica*). East Indian L. Rootstock with small scale-like lvs., many ft. long, used as food in some countries: lvs. mostly 3–6 ft. above the water, 1–3 ft. across: fls. 4–10 in. across, fragrant, pink or rose. S. Asia to Australia, sometimes nat. Many vars. are in cult. as **alba grandiflora**; **alba plena** (*Shiroman*); Grossherzog Ernst Ludwig (*N. flavescens* × *N. Osiris*), salmon rose; **kermesina**, light rose; Kinshiren, white shaded pink; Osiris, deep rose; **pulchra**, dark rosy-red; **pekinensis rubra**, rosy-carmine and **plena** large and double; **pygmæa**, dwarf; **rosea**, rosy-pink.—This plant is sometimes called Egyptian lotus, but that name belongs rather with *Nymphæa Lotus.*

speciosum: *N. Nelumbo.*

NELUMBO: *Nelumbium.*

NEMASTYLIS. *Iridaceæ.* American bulbous herbs with long narrow lvs. and blue or purple fls. lasting only a day; tender in the N.

acuta. To 2 ft., the sts. simple or forked: lvs. to 1 ft. long: fls. to 2 in. across, 2–3 from a spathe, Apr.–June. Tenn. to Tex.

NEMESIA. *Scrophulariaceæ.* Tender African herbs and subshrubs with attractive tubular fls. in various colors, usually in terminal racemes, the corolla-tube 2-lipped, short, with a sac or spur in front, blooming from June–Sept.: lvs. opposite. Much like short-tubed linarias.

Nemesias are easily grown as annuals; they should stand about 6 inches apart in the garden; seeds are commonly started in the house.

chamædrifolia. Ann. to 2 ft.: lvs. ovate, to 1½ in. long: fls. pale pink, spurred, solitary in the axils. S. Afr.

compacta: *N. versicolor* var.

floribunda. Ann. to 15 in.: lvs. ovate or oval, to 1½ in. long: fls. whitish, spurred, in many-fld. racemes to 5 in. long. S. Afr.

hybrida: hort. name.

lilacina. To 15 in.: lvs. narrow-lanceolate, to 1½ in. long: fls. small, lilac, spurred, in racemes to 1 ft. long. S. Afr.

strumosa. Ann. to 2 ft.: lvs. lanceolate, to 3 in. long: fls. white or in shades of yellow and purple, often purple marked on the outside, the bearded throat spotted on a yellow ground, with pouch at base, in racemes to 4 in. long. S. Afr. Var. Suttonii comprises improved forms in white, yellow, rose-pink, orange, crimson and scarlet. Var. **nana compacta** is dwarf.

versicolor. Ann. to 1 ft. or more: lvs. ovate to lanceolate, to 2 in. long: fls. in various colors, the spur nearly straight or incurved, in racemes to 3 in. long. Var. **compacta** (*N. compacta*) is a compact form, very free flowering.

NEMOPANTHUS. Mountain-Holly. *Aquifoliaceæ.* One neat deciduous bush distinguished from Ilex by the narrow separate petals and very small not persistent sepals. **N. mucronata** (*N. canadensis. N. fascicularis*). To 10 ft., glabrous, with purplish young growths, nearly or quite entire elliptic or oblong or somewhat obovate mucronate-tipped lvs. to 1½ in. long: fls. axillary, on slender pedicels: drupe about ¼ in. diam., red. Mostly in bogs and swamps, Newf. to Wis. and Va.—Handsome in fr. and in autumn foliage.

NEMOPHILA. *Hydrophyllaceæ.* Ann. small soft fragile herbs, mostly Californian, glabrous, pubescent or prickly-hairy, with usually pinnatifid lvs., blue or white solitary peduncled fls. or rarely in racemes, the calyx having 5 spreading or reflexed appendages in each sinus, stamens not exserted; grown in the garden for the continuous spring and summer bloom.

Seeds may be sown where the plants are to grow, in early spring for summer bloom; the flowers are small but usually profuse and bright. Recent studies have modified the conception of the cultivated species. The following are native in California.

atomaria. At length prostrate: corolla rotate, the parts broad and overlapping, rim white but body color reddish-black, red, brownish, to blue and purplish and solid or in spots, stripes, or mottles. Var. **discoidalis**, center brownish-purple and edges white.—Color names in catalogues and lists are likely to belong with this species.

aurita. Fiesta-Flower. Climbing or scrambling to 6 ft. by prickles on sts.: petioles broadly winged and clasping: fls. purple or violet and paler outside, to 1 in. across.

crambeoides: *N. linifolia* var.

discoidalis: *N. atomaria* var.

insignis. Baby Blue-Eyes. Procumbent or prostrate at maturity: fls. broad bell-shaped, clear blue, not spotted or margined. Var. alba has white fls., var. grandiflora large fls.

integrifolia. Erect, becoming nearly or quite prostrate: lvs. to three times as long as broad, only seldom entire: fls. saucer-shaped, blue with deepest color at outer part. S. Calif.

linifolia. Prostrate and loosely branched: fls. funnel-shaped and rather small, pale blue or purplish with solid or spotted black eye, or sometimes clear white throughout. Var. **crambeoides** has light blue fls. veined purple

maculata. Five-Spot. Ascending or decumbent: fls. white with deep purple spot at tip of each lobe. Var. **grandiflora** has larger fls.

Menziesii: insufficiently described originally for clear identification; cult. plants passing under this name may be varieties of *N. atomaria, N. insignis, N. integrifolia,* or *N. liniflora,* probably mostly the first one.

NEOBENTHAMIA. *Orchidaceæ.* One E. African orchid, **N. gracilis.** To 6 ft. high: lvs. linear-lanceolate, to 8 in. long: fls. white with yellow center of lip and red spots, about 1 in. across, on long stalks in many-fld. racemes to 5 in. long, Feb.–May. See *Orchids.*

NEOBESSEYA. *Cactaceæ.* Four small simple or tufted globose or depressed cacti, on the Great Plains of the U. S.: plant body bearing spiralled or irregular tubercles mostly grooved on the upper side and which are spine-bearing at the apex: fls. near top of plant, relatively large, yellow or pink. See *Cacti.*

missouriensis (*Cactus, Mammillaria* and *Coryphantha missouriensis. Mammillaria Nuttallii*). St. usually solitary, globose, 1–2 ft. high, the tubercles ½ in. or more long, spines 10–20 together: fls. about 1 in. long and broad, yellow or reddish. N. D. to Tex. and west.

NEOCOGNIAUXIA: *Lælia monophylla.*

NEOLLOYDIA. *Cactaceæ.* A few small cylindric and densely spiny tubercled cacti of Tex. and Mex., formerly named in Mammillaria and Echinocactus: central spines 1–several and much longer than the numerous radials: fls. large, pink or purple. See *Cacti.*

Beguinii (*Echinocactus Beguinii*). Cylindric, to 6 in. high, tubercles in geometric figures and covered with spines, radials 20 or more and white: fls. bright pink, to 1½ in. long. Mex.

clavata (*Mammillaria clavata. M. rhapidacantha*). Simple, cylindric, to 6 in. high, bluish-green, tubercles conic and axils woolly when young, radials 6–12, central 1: fls. about ¾ in. long, creamy-white. Mex.

conoidea (*Mammillaria conoidea. Echinocactus conoideus*). Mostly cespitose, parts short-cylindric, tubercles obtuse and axils very woolly, spines very many and covering the plant, the radials white: fls. purple. N. Mex.

NEOMAMMILLARIA: *Mammillaria.*

NEOPIERIS: *Lyonia.*

NEOWASHINGTONIA: *Washingtonia.*

NEPENTHACEÆ. Nepenthes Family. One genus of semi-woody more or less climbing insectivorous plants native from E. Indies to Madagascar, sometimes grown under glass as curiosities and once assembled as much-prized fancier's plants in many forms and hybrids. The family is characterized by alternate lvs. with midrib prolonged into tendril bearing at end a hollow pitcher with thickened rim and large or small lid, small diœcious fls. in racemes, having 3–4 sepals, no petals, 4–24 united stamens, superior 4-celled ovary, and fr. a caps. The family appears in the sequence associated with Sarraceniaceæ, Droseraceæ, Resedaceæ.

NEPENTHES. Pitcher-Plant. *Nepenthaceæ.* Characters as above; many of the named kinds are artificial hybrids.

Pitcher-plants are suitable for pots or baskets suspended from roof of greenhouse, with temperature of not less than 65°. The best potting material is fibrous peat, moss and sand. They should be shaded from bright sunshine. Propagated by cuttings of ripened shoots and by seeds in a close propagating-frame.

atrosanguinea. Hybrid probably of *N. distillatoria* and *N. Sedeni:* pitchers reddish-purple mottled with pale green, wings fringed.

Chelsoni. Hybrid between *N. Hookeriana* and *N. Dominii:* pitchers yellowish-green spotted with purple, wings fringed.

Courtii. Hybrid, with *N. Dominii* as one of the parents: pitchers green mottled with purple, wings fringed.

Dickinsoniana. Hybrid between *N. Rafflesiana* and *N. Veitchii:* pitchers green marked with purple, wings fringed.

distillatoria. Pitchers pale green to dull red, to 5 in. long and 1½ in. across, wings fringed. Ceylon.

Dominii. Hybrid with *N. Rafflesiana* as one of parents: pitchers mottled green and purple, wings fringed.

edinensis. Hybrid between *N. Rafflesiana* and *N. Chelsoni:* pitchers yellow-green spotted with dark purple, wings fringed.

Henryana. Hybrid with *N. Hookeriana* and *N. Sedeni:* pitchers red or greenish-red and mottled, wings fringed.

Hookeriana. Pitchers pale green marked with purple, to 6 in. long and 3 in. across, the wings broad and doubly fringed or unfringed on upper pitchers. Borneo.

intermedia. Hybrid with *N. Rafflesiana* as one parent: pitchers green spotted with purple, the wings fringed.

khasiana. Pitchers green or reddish-green, to 7 in. long and 1½ in. across, wings narrow and fringed. India.

Mastersiana. Hybrid between *N. sanguinea* and *N. khasiana:* pitchers deep crimson or crimson-green with purple spots, the wings fringed or small.

paradisæ. Hybrid with *N. Phyllamphora* as one parent: pitchers purple-red below, yellow-spotted above.

Patersonii. Hybrid of uncertain parentage: pitchers yellowish-green mottled with red, the wings narrow and fringed.

Phyllamphora. Pitchers pale to reddish-green or red, to 6 in. long and 1½ in. across, the wings narrow and cord-like. S. China, E. Indies.

Rafflesiana. Pitchers pale green spotted with purple, to 7 in. long and 4 in. across, the lower urn-shaped and upper funnelform. Malacca to Borneo and Sumatra.

sanguinea. Pitchers red or reddish-green, to 10 in. long and 3 in. across, wings fringed or plain. Malaya.

Sedeni. Hybrid of uncertain parentage: pitchers slightly contracted in middle, the wings fringed.

splendida. Hybrid between *N. Hookeriana* and *N. Phyllamphora.*

Veitchii. Pitchers yellowish-green to reddish, hairy, to 8 in. long and 3 in. across, wings fringed, with wide rim. Borneo.

NEPETA. *Labiatæ.* Ann. and per. mostly aromatic herbs with toothed or cut lvs., blue or white fls. in whorls in clusters or spikes; grown for medicinal purposes and the creeping kinds for ground-cover in shady places. Catnip is one of the sweet herbs. Propagated by seeds and by division; easily grown.

amethystina. Per. to 2 ft., soft-tomentose: lvs. cordate-lanceolate, to 1½ in. long: fls. blue, ½ in. long, in clusters forming a long raceme. Spain.

barbata. To 1½ ft.: lvs. ovate, to 1½ in. long and ½ in. wide, rounded or hastate at base: fls. in few-fld. loose racemes, the spreading lower lip barbed. Turkestan.

Cataria. Catnip or Catnep. Catmint. Per. to 3 ft., pubescent and pale: lvs. ovate, to 2½ in. long: fls. whitish or pale purple, ¼ in. long, in dense spikes to 5 in. long. Eu., Asia; widely nat. in N. Amer.—An old sweet herb.

cyanea. To 6 in., sts. ascending, soft-tomentose: lvs. ovate or oblong, small, wrinkled: fls. pale purple, small, in numerous racemes 1 in. long. Caucasus.

distans. Per. to 1½ ft., soft-tomentose: lvs. ovate-cordate, to 2 in. long: fls. rose, in spikes to 8 in. long. Himalayas.

Glechoma: *N. hederacea.*

grandiflora. Per. to 2 ft.: lvs. ovate-cordate, to 2½ in. long: fls. blue, ¾ in. long, in clusters forming loose racemes. Caucasus.

hederacea (*N. Glechoma. Glecoma hederacea*). Ground Ivy. Gill-over-the-Ground. Field-Balm. Creeping per. forming a mat, useful as ground-cover in both exposed and shady places: lvs. round or kidney-shaped, deeply cordate, to 1½ in. across: fls. light blue, to 1 in. long, in few-fld. clusters. Eu., Asia; widely nat. in N. Amer. Var. variegata has variegated lvs.

lanceolata: *N. Nepetella.*

macrantha. Per. to 3 ft.: lvs. ovate-lanceolate, to 4 in. long: fls. blue, to 1½ in. long, in few-fld. clusters. Siberia.

Mussini. Per. to 2 ft., much branched, white-pubescent: lvs. oblong-ovate, to ¾ in. long: fls. blue with dark spots, to ½ in. long, in clusters forming long racemes. Caucasus, Persia.

Nepetella (*N. lanceolata*). Per. to 4 ft.: lvs. lanceolate, 1 in. long, gray-pubescent: fls. white or pink spotted with purple, ½ in. long, in spikes. S. Eu.

nuda. Per. to 4 ft.: lvs. oblong, to 2 in. long, nearly glabrous: fls. violet to white spotted with purple, ½ in. long, in many-fld. racemes. S. Eu.

ucranica. Per. to 2 ft., pubescent or nearly glabrous: lvs. oblong-ovate to oblong: fls. blue, small, in loose bracted cymes. E. Eu., W. Asia.—Not showy; the material planted under this name is usually *N. grandiflora.*

violacea: a listed name of uncertain botanical identity.

Wilsoni. Per. to 2½ ft., hairy: lvs. oblong-lanceolate, to 2 in. long, wrinkled: fls. dark blue, 1 in. long, in distant clusters. China.

NEPHELIUM: *Litchi* and *Euphoria.*

NEPHRODIUM: *Dryopteris.*

NEPHROLEPIS. Sword-Fern. *Polypodiaceæ.* Popular trop. and subtrop. ferns of both hemispheres, some of them favorite house and conservatory plants: lvs. usually long and narrow, pinnately compound or divided; sori on upper forks of veins.

The sword-ferns are greenhouse or porch subjects, sometimes grown in vases and baskets; they are commonly propagated by rooting runners, as good spores may not be produced by the horticultural varieties. The plants thrive under common or even untoward conditions and produce dense crowns of long often drooping fronds. See *Ferns.*

acuminata (*N. davallioides*). Lvs. drooping, to 3 ft. long and 1 ft. wide, segms. linear-lanceolate, coarsely toothed, the fertile ones much contracted. Malaya.

acuta: *N. biserrata.*

biserrata (*N. acuta*). Lvs. drooping or arching, to 4½ ft. long and 1 ft. wide, segms. distant, to 6 in. long, toothed. Tropics. Var. furcans has forked segms.

bostoniensis: *N. exaltata* var.

bulbiferum: perhaps a form of *Polystichum aculeatum.*

cordata: *N. cordifolia.*

cordifolia (*N. cordata. N. tuberosa*). Rhizome bearing tubers: lvs. to 2 ft. long and 2½ in. wide, erect or nearly so, bright green, segms. close together, to 1¼ in. long, sharp-toothed. Tropics and subtropics. Hort. vars. are **compacta, gigantea, plumosa, tessellata, variegata.**

davallioides: *N. acuminata.*

Duffii (*N. cordifolia* var. *Duffii*). Tufted, graceful: lvs. to 2 ft. long and ½ in. wide, usually forked or crested at tips, segms. nearly orbicular, ¼ in. across, wavy-toothed. New Zeal. or S. Sea Isls.—Probably a mutant of *N. cordifolia.*

exaltata. Sword-Fern. Stiff, erect: lvs. to 5 ft. long and 6 in. wide, segms. close together, to 3 in. long, entire or slightly toothed. Fla. to Brazil and in Afr. and E. Asia.—This species has given rise to numerous sports or mutants with much-divided and even crested fronds and that have received Latinized names, some of which are entered here. Var. **bostoniensis**, Boston-Fern, is more graceful and drooping, a famous window-garden and table fern. From it or its derivatives have arisen many forms as: *Amersohli*, *Childsii*, *Dreyeri*, *edmontoniensis*, *elegantissima* and its vars. *compacta* and *compacta cristata*, *Elmsfordii*, *falcata*, *Forsteriana*. *Galvestoni*, *Giatrasii*, *Goodi*, *Gretnai*, *Harrisii*, *Hillsii*, *lycopodioides*, *Macawii*, *magnifica*, *Milleri*, *Millsi*, *muscosa*, *Norwoodi*, *philippinensis*, *Piersonii*, *Randolphi*, *robusta*, *Rooseveltii*, *Scholzelii*, *Schuberti*, *Scottii*, *Smithii*, *splendida*, *superba*, *superbissima*, *tripartita*, *todeoides*, *viridissima*, *Wanamakeri*, *Whitmanii*, *Wicheri*, *Wilsoni*, *Wittboldii*, *Wredei*.

pectinata (*N. cordifolia* var. *pectinata*). Basket-Fern. Small, compact, grayish-green: lvs. to 1½ ft. long and 1 in. wide, segms. close together, ½ in. long, toothed. Trop. Amer.

tuberosa: *N. cordifolia*.

NEPHTHYTIS PICTURATA: *Rhektophyllum mirabile*. **triphylla**: horticultural name unidentifiable botanically, probably not a Nephthytis.

NERINE. *Amaryllidaceæ*. S. African bulbous herbs with strap-shaped basal lvs. not appearing with the bloom, and funnelform fls. in shades of red to white borne in umbels at top of solid scape, the perianth-tube very short, blooming in autumn (Mar. to May in S. Afr.).

Nerines are tender and grown mostly in pots in the greenhouse, and out-of-doors in mild climates. They should be given plenty of water until after flowering, and from May to August the bulbs should be rested. Propagated by offsets.

curvifolia. To 1½ ft.: lvs. 1 ft. long, curved, glaucous, after fls.: fls. scarlet, stamens not exserted. Var. **Fothergilli** (*N. Fothergilli*) is stronger with numerous fls.

Fothergilli: *N. curvifolia* var.

sarniense (*Amaryllis sarniensis*). Guernsey-Lily. To 1½ ft.: lvs. to 1 ft. long and ¾ in. wide, after fls.: fls. crimson, 1½ in. long, the segms. slightly crisped and the bright red stamens exserted.

NERIUM. *Apocynaceæ*. Evergreen shrubs with lvs. opposite or in 3's or 4's, showy funnelform fls. in terminal cymes, and fr. of 2 long follicles; native from Medit. region to Japan.

Oleanders are grown out-of-doors in the South and as pot- or tub-plants North. They require little attention in the South; in the North plants should be cut back and rested after flowering, then potted in loam and rotted manure. Propagated easily by cuttings of mature firm wood, sometimes in water.

indicum (*N. odorum*). Sweet-scented Oleander. To 8 ft.: lvs. linear-lanceolate, to 10 in. long: fls. rosy-pink to white, often double, fragrant, 2 in. across. Persia to Japan.

odorum: *N. indicum*.

Oleander. Oleander. To 20 ft.: lvs. oblong-lanceolate, to 8 in. long: fls. to 3 in. across, white to red and purple, as indicated by the trade names **album**, **atropurpureum**, **carneum**, **roseum**, often double: lvs. sometimes variegated with white or yellow. Medit. region.—Popular as a tub plant; slips are sometimes rooted in bottles of water.

NERTERA. *Rubiaceæ*. Creeping per. herbs with small opposite lvs., solitary tubular 4–5-lobed fls., and fr. a fleshy drupe; native in the southern hemisphere.

One species is cultivated as a ground-cover in California and under glass in the North. It should be grown in a shady place in sandy or light soil. Propagated by seeds and division.

depressa. Bead-Plant. Sts. to 10 in. long, matted: lvs. broad-ovate, $^1/_6$ in. long: fls. greenish, minute and inconspicuous: fr. orange, about ¼ in. across. S. Amer., New Zeal., Tasmania.

NESÆA: *Decodon*.

NETTLE: *Urtica*. **Dead**: *Lamium*.

NEVIUSIA. *Rosaceæ*. One deciduous shrub native in Ala., grown out-of-doors for ornament and sometimes forced under glass. **N. alabamensis.** Snow-Wreath. To 6 ft.: lvs. alternate, ovate, to 3 in. long, toothed: fls. white, without petals, 1 in. across, in clusters, of feathery appearance due to the many stamens.—Propagated by seeds and cuttings of young wood in the greenhouse. It is hardy to New England and Cent. N. Y. in somewhat protected places.

NEYRAUDIA. *Gramineæ*. One large leafy per. grass native in trop. Asia, trop. Afr. and Madagascar, planted somewhat for ornament in S. Fla. and S. Calif. **N. madagascariensis.** To 8 ft. or more: lvs. to 2 ft. long and 1 in. wide: spikelets awned, in compound nodding plume-like panicles to 3 ft. long. See *Grasses*.

NICANDRA (*Physalodes*). *Solanaceæ*. Ann. herbs from Peru differing from Physalis in the 3–5-celled ovary and dry rather than fleshy fr.; fls. larger and more showy. Sometimes grown from seed sown in the open in the S., under glass in the N., as an ornamental subject; escaped as a weed in some places.

Physalodes. Apple-of-Peru. Strong spreading old-fashioned garden plant, to 4 ft.: lvs. oval, sinuate-toothed: fls. blue, 1 in. or more across, wheel-shaped, solitary: berry inclosed in an enlarged strongly 5-winged calyx. Escaped in U. S. and tropics.

violacea. Sts. dark violet: lvs. to 10 in. long, with colored hairs on upper surface: fls. solitary, bell-shaped, violet-blue on upper half and white on lower.

NICKER-NUT: *Cæsalpinia Crista*.

NICOTIANA. *Solanaceæ*. Herbaceous annuals and perennials, rarely shrubby or tree-like, usually sticky-hairy, with long tubular strongly fragrant fls., white, greenish, yellow or purple, mostly opening at night, in terminal panicles or racemes: lvs. alternate and simple, possessing narcotic-poisonous properties: grown for ornament and one yielding tobacco.

Nicotianas are easily grown but are sensitive to frost. Some of them make good pot-plants and border subjects. Propagated by seed, the ornamental forms also by cuttings; *N. alata* var. *grandiflora* by root-cuttings.

acuminata. Per. but grown as ann.: lvs. ovate-lanceolate, long-acuminate, short-petioled, undulate: fls. white, 3 in. long, salverform, the tube 5 times as long as calyx, lobes obtuse. Chile.

affinis: *N. alata* var. *grandiflora*.

alata. Tender per. to 5 ft.: lvs. lanceolate or oblong, to 4 in. long, acute or obtuse, the petiole with narrow wings, undulate: fls. fragrant at night, closing in cloudy weather, salverform, corolla-limb white within, pale violet beneath, 2 in. across, lobes acute or notched, tube 4–5 times longer than calyx. Brazil, Uruguay, Paraguay. Var. **grandiflora** (*N. affinis*), Jasmine Tobacco, has very large fls. with much dilated tube.

angustifolia: *N. Tabacum* var.

arborea: *N. glauca*.

attenuata. Ann. to 4 ft.: lvs. broad-ovate to lanceolate, to 4 in. long, petioled: fls. white or greenish, salverform, to 1 in. long, opening at night. B. C. to Mont. and Mex.

auriculata. Ann.: lvs. oblong-lanceolate, acuminate, clasping and ear-shaped at base: fls. funnel-shaped, red, lobes acuminate. Sardinia.

Bigelovii. Indian Tobacco. Ann. to 2 ft.: lvs. oblong-ovate to lanceolate, to 7 in. long, acute, short-petioled or sessile: fls. white, salverform, 2 in. long, limb 1 in. across. Calif. to Nev. and Ariz.

cerinthoides: a listed name of uncertain botanical application.

chinensis: *N. Tabacum* var. *angustifolia.*

colossea: *N. tomentosa.*

Forgetiana. Ann. to 3 ft.: lvs. papery, oblong-lanceolate, about 1 ft. long, obtuse, with short winged petiole: fls. rose, funnelform, to 1¼ in. long and 1 in. across, the lobes obtuse. Brazil.

fragrans: *N. suaveolens* var. *macrantha.*

fruticosa: a listed name of uncertain botanical application.

gigantea: *N. Tabacum.*

glauca (*N. arborea*). Tree Tobacco. Tree-like, to 20 ft., glaucous-blue and glabrous: lvs. ovate, acute, long-petioled: fls. yellow, salverform, 1½ in. long, lobes acute. S. Amer.; nat. in Tex., Calif. and elsewhere.

glutinosa. Ann.: lvs. cordate-ovate, abruptly acuminate, petioled: fls. reddish-yellow, drooping, salverform, twice as long as calyx, lobes acute. Peru, Bolivia.

grandiflora purpurea: a form of *N. Tabacum* var. *macrophylla;* see also *N. alata* var.

lancifolia: an unidentified name in lists; perhaps a form of *N. Tabacum.*

Langsdorffii. Ann. to 3 ft.: lvs. ovate to lanceolate, obtuse, short-petioled or sessile: fls. greenish-yellow, drooping, salverform, 3 times longer than calyx, lobes obtuse. Brazil, Chile.

longiflora. Ann. or per. to 3 ft.: lvs. ovate-lanceolate, to 9 in. long, obtuse or acute, sessile or short-petioled: fls. salverform, fragrant, night-opening, yellowish-violet without, white within, to 6 in. long, 6–7 times longer than calyx, the lobes obtuse or notched. Tex. to Chile and Argentina.

macrophylla: *N. Tabacum* var.

noctiflora. Per. to 3 ft.: lvs. oblong to linear-lanceolate, obtuse or acute, short-petioled or sessile: fls. salverform, opening at night, fragrant, white within, purplish without, 3 times as long as calyx, lobes notched. Argentina, Chile.

paniculata. Ann. to 3 ft.: lvs. ovate, acute or obtuse, petioled: fls. yellowish-green, salverform, 6 times longer than calyx, lobes acute. Peru.

petiolaris. Ann.: lvs. cordate-ovate, to 1 ft. long, acuminate, with short reddish petioles: fls. red, funnelform, the lobes acuminate or acute. Habitat unknown.

plumbaginifolia. Lvs. oblong, sessile or clasping, undulate: fls. salverform, greenish-white, to 2 in. long, opening in evening. Mex., W. Indies.

quadrivalvis. Ann. to 2 ft.: lvs. ovate-lanceolate or oblong, petioled, upper sessile: fls. funnelform, white inside, purplish outside, to 1 in. long. Wash., Ore., Mont.

rustica. Ann., bien. or trien. to 3 ft.: lvs. ovate or oblong, to 1 ft. long, obtuse, petioled, thick: fls. day-opening, yellowish or greenish, 1 in. long, salverform, 2–3 times longer than calyx, lobes obtuse. Mex., Tex. Var. **humilis** is listed.

Sanderæ. Hybrid between *N. alata* and *N. Forgetiana:* ann. to 3 ft.: lvs. spatulate, to 1 ft. long, acuminate, petioled, undulate: fls. salverform, tube greenish-yellow tinted with rose, to 3 in. long, the limb carmine-rose, 3 times longer than calyx, lobes acute, obtuse or notched.

sanguinea: listed name of uncertain botanical standing.

suaveolens. Ann. or bien. to 2 ft.: lvs. spatulate to ovate-lanceolate, obtuse or acute, short-petioled: fls. nodding, greenish-purple, night-opening, fragrant, to 2 in. long and 1 in. wide, the limb somewhat 2-lipped, lobes obtuse. Australia. Var. **macrantha** (*N. fragrans*) has white fls.

sylvestris. Per. to 5 ft. or more: lvs. wrinkled, oblong, obtuse, sessile or clasping: fls. drooping, not closing in the morning when cloudy, white, fragrant, salverform, 3½ in. long, 7 times longer than calyx, lobes acute. Argentina.

Tabacum (*N. gigantea*). Tobacco. Ann. to 6 ft.: lvs. oblong or oblong-lanceolate, 1 ft. or more long, acuminate, sessile: fls. diurnal, to 2 in. long, woolly, funnelform, rose-colored or red, lobes acute. Probably trop. Amer. Var. **angustifolia** (*N. chinensis*) has narrow lvs. Var. **macrophylla** (*N. macrophylla*) has larger lvs. and fls.

texana: listed name without botanical standing.

tomentosa (*N. colossea*). Giant N. Per., often woody, to 20 ft.: lvs. obovate-oblong, to 1½ ft. long, acuminate, with winged petiole: fls. 1½ in. long, salverform, pale green without, yellowish tinged with red within, lobes obtuse. Brazil. Var. **variegata** has mottled and margined foliage.

trigonophylla. Ann. to 3 ft.: lvs. obovate-oblong, to 6 in. long, sessile, lower with winged petioles: fls. salverform, creamy-white, to 1 in. long. Colo. to Calif. and Mex.

virginica: a name of uncertain application.

viscosa. Ann.: lvs. oblong, to 3 in. long, obtuse, sessile or clasping: fls. funnelform, twice as long as calyx, lobes obtuse. Argentina.

wigandioides. Per. to 9 ft.: lvs. ovate, undulate, petioled: fls. salverform, yellowish-white, drooping. Colombia.

NIDULARIUM. *Bromeliaceæ.* Brazilian epiphytic herbs with prickly-margined lvs. in dense basal rosettes and red, purplish or white fls. sessile among the lvs. and subtended by modified or bract-lvs.; grown as a glasshouse subject. Cult. as for *Bromeliaceæ.*

amazonicum: *Canistrum amazonicum.*

fulgens (*N. pictum*). Lvs. to 1 ft. long and 2 in. broad, spotted with dark green: fls. white with violet limb, in dense clusters, the bract-lvs. bright scarlet.

Innocentii. Lvs. to 1 ft. long, strap-shaped, tinted with brown or red: fls. white, in dense heads, the bract-lvs. bright red.

Lindeni: *Canistrum Lindeni.*

pictum: *N. fulgens.*

NIEREMBERGIA. Cup-Flower. *Solanaceæ.* Low herbaceous perennials and subshrubs grown in the open border, rock-garden or as pot-plants for the showy pale violet or white tubular fls. which often have a purple center, and are borne singly at or near the tip of the branches: lvs. small, alternate, simple and entire.

The species described are hardy as far north as New York. Propagated by seeds or in the fall from cuttings of firm shoots; *N. rivularis* most easily by division of the creeping stems where they have rooted.

atroviolacea: color form of *N. frutescens.*

calycina: *N. gracilis.*

filicaulis: *N. gracilis.*

frutescens (*N. fruticosa*). Tall C. To 3 ft., shrubby, much branched: lvs. linear, to 1 in. or more long: fls. 1 in. across, the saucer-shaped limb white tinted with lilac or blue, the throat yellow. Chile. Var. **albiflora** has white fls., **atroviolacea** dark violet, and **grandiflora** larger fls.—This is the prevailing species in cult.

gracilis (*N. calycina. N. filicaulis*). Prostrate or creeping, sts. ascending to 8 in.: lvs. linear, to ½ in. long: fls. with convex limb, white tinged and veined with purple toward the center, throat yellow. Argentina. Var. **Crozyana** has more abundant violet-tinted fls.—*N. frutescens* is likely to be cult. under this name.

rivularis. White-Cup. Sts. creeping and rooting, matted, to 6 in. high: lvs. oblong or oblong-spatulate, to 1 in. long, long-petioled: fls. 2 in. across, creamy-white sometimes tinged rose or blue, limb broadly bell-shaped, throat golden. Argentina.

NIGELLA. Fennel-Flower. *Ranunculaceæ.* Ann. herbs with lvs. pinnately cut into linear or thread-like segms., often showy white, blue or yellow fls., and fr. a caps.; native in Medit. region and W. Asia.

Nigellas are planted in the flower-garden and of easy culture. Propagated by seeds, that may be sown directly where the plants are to stand; open sunny situation.

aristata: *N. arvensis.*

arvensis (*N. aristata*). To 1½ ft.: lfts. filiform: fls. bluish-white, 1 in. or more across, solitary, without involucre: fr. of 3–5 strongly ribbed carpels joined about two-thirds their length, with long beak-like styles. N. Afr., Eu., Asia.

damascena. LOVE-IN-A-MIST. To 1½ ft. or more, much branched: lfts. filiform: fls. white or light blue, to 1½ in. across, solitary and surrounded by a large finely divided attractive involucre: fr. globular, inflated, carpels united to top, with long erect styles. S. Eu.

diversifolia. Lower lvs. oblong-linear, entire, st.-lvs. sessile, palmately parted into linear lfts.: fls. pale bluish, in cymes: fr. of 3 carpels united about to middle, shortly beaked. Turkestan.

hispanica. To 1½ ft., branching: lfts. linear but not filiform: fls. blue with red stamens, to 2½ in. across, solitary or in 2's, without involucre: fr. ribbed, the carpels united nearly to top, the styles spreading. Spain, N. Afr. Var. **alba** has white fls. and **atropurpurea** purple.

sativa. To 1 ft. or more, branching: lfts. linear but not filiform: fls. blue, to 1½ in. across, solitary, without involucre: fr. of 3–7 carpels united to top, inflated, styles spreading. Medit. region.—Seeds are used for seasoning.

NIGHTSHADE: *Solanum.* **Enchanters-**: *Circæa lutetiana.* **Malabar-**: *Basella.*

NINEBARK: *Physocarpus.*

NIOBE: *Hosta.*

NIPA. *Palmaceæ.* One gregarious monœcious unarmed feather-palm with branched rootstocks and no upstanding trunk: spadices erect from the rootstock; staminate fls. in catkin-like short lateral branches among the many bracts; stamens 3; pistillate fls. in dense terminal heads: fr. a large globose aggregation of obovoid fibrous carpels. A plant of estuaries and brackish swamps, India, Malaya, Philippines, Australia; stands in S. Fla. in suitable locations; a handsome plant when properly placed. **N. fruticans.** Lvs. from crowns of rootstocks, 10–30 ft. long, gracefully arching; pinnæ very many, well separated, rigid, long-acuminate, 2–3 ft. long, ridged, glaucous underneath: head of fr. 10–12 in. diam., the angular hard carpels 4–5 in. long.

NIPHOBOLUS: *Cyclophorus Lingua.*

NIPPON-BELLS: *Shortia uniflora.*

NODE: a joint where a leaf is borne or may be borne; also incorrectly the space between two joints, which is properly an internode.

NOLANA. *Nolanaceæ.* Prostrate herbaceous per. but grown as ann., with showy tubular blue fls., and entire usually fleshy lvs.; native in Chile and Peru.

Nolanas are grown as basket-plants and also useful in the border or on rocky hillsides. They require the usual treatment for annuals, with a sunny exposure.

atriplicifolia (*N. grandiflora. N. paradoxa*). Sts. spotted and streaked with purple above, to 1 ft. or more long: lvs. spatulate, basal with petioles 3 in. long: fls. blue with white throat, yellow inside, to 2 in. across. Var. **violacea** has violet fls.

grandiflora: *N. atriplicifolia.*

lanceolata. Whole plant hoary-pubescent: lvs. lanceolate, to 6 in. long: fls. deep blue with yellowish-white spotted throat, to 2 in. across.—Stock grown under this name is likely to be *N. atriplicifolia.*

paradoxa: *N. atriplicifolia.*

NOLANACEÆ. NOLANA FAMILY. Three genera of herbs or subshrubs native in Chile, Peru and Bolivia, with lvs. alternate or paired, bisexual solitary fls. having 5-parted calyx, gamopetalous 5-lobed corolla, 5 stamens, superior ovary and fr. of 5–30 nutlets or follicles. Only the genus Nolana is known to hort. The family is sometimes included in Convolvulaceæ and in Solanaceæ.

NOLINA. *Liliaceæ.* Plants sometimes with tree-like trunks or often without apparent sts., having linear stiff lvs. and very small whitish fls. in panicles; occasionally planted in warm climates; rigid dry-country and desert plants. For cult. see *Yucca.*

Beldingi. To 25 ft., branched near top: lvs. to ¾ in. broad and 3 ft. long, glaucescent: panicle compound, primary divisions about 1½ ft. long: fr. emarginate. Lower Calif.

longifolia (*Dasylirion longifolium*). To 10 ft., swollen at base and with few branches toward top: lvs. 3 ft. or more long and 1¼ in. wide, rough on edge. Mex.

Palmeri. Stemless: lvs. about ½ in. wide, rough on edge. Lower Calif.—Roots said to be used as a substitute for soap.

Parryi. To 6 ft., unbranched: lvs. in dense crown, to 3 ft. long and ¾ in. broad: flowering stalk to 2 ft. long, branches stout. S. Calif.

tuberculata: *Beaucarnea recurvata.*

NOLTEA. *Rhamnaceæ.* One S. African evergreen shrub, sometimes grown in Calif. **N. africana** (*Willemetia africana*). To 12 ft.: lvs. alternate, oblong-lanceolate, to 2½ in. long, toothed, pale beneath: fls. white, small, in panicles about 1 in. long: caps. ⅛ in. across. Var. **aurea** is listed.—Propagated by seeds and cuttings of green or mature wood.

NOPALEA. *Cactaceæ.* Opuntia-like cacti of Mex. and Guatemala, differing in erect petals and elongated filaments and style: much branched plants with cylindrical trunks and flattened often narrow branches, producing small nearly terete lvs. which are soon deciduous; spines present in most of the species: fr. a juicy red edible berry. Cult. as for Opuntia. See *Cacti.*

Auberi (*Opuntia Auberi*). To 30 ft., with jointed trunk not very spiny, joints narrow to 1 ft. long, bluish or glaucous, areoles bearing wool and glochids and spines 1 or 2 or wanting: fls. rose-pink, about 3½ in. long. Cent. and S. Mex.

cochenillifera (*Opuntia cochenillifera*). COCHINEAL PLANT. To 16 ft., trunk sometimes 8 in. diam., joints oblong and often 20 in. long and mostly spineless, the many glochids caducous: fls. on tops of joints, upwards of 2 in. long, pink or rose. Long cult. but original habitat unknown.—The cochineal of commerce is the insect that feeds on the plant, collected in bulk, once extensively used as a dye. This is one of the cacti on which the insect subsists.

dejecta (*Opuntia dejecta*). To 6 ft. with definite trunk, very spiny, joints narrow and 4–6 in. long: fls. 2 in. long, dark red. Probably Panama; cult. in trop. Amer.

NOPALXOCHIA. *Cactaceæ.* One Mexican cactus with irregularly branching habit, fls. funnelform with tube shorter than limb, segms. or sepals and petals many, outer segms. acute or acuminate. See *Cacti.* **N. phyllanthoides** (*Epiphyllum phyllanthoides*). Somewhat woody, branches at length hanging and thin and flattened above and often 2 in. broad: fls. diurnal, rose or red, tube about 1 in. long.

NORMANBYA. *Palmaceæ.* A trop. Australian palm that has been planted in Fla.: monœcious, unarmed, feather-lvd.: the genus is particularly distinguished from Drymophlœus and Ptychosperma by the non-sulcate seed, and the peculiarly arranged pinnæ which are in groups resulting apparently from the splitting of one pinna or lft. into several that remain united at their bases, and each pinna narrow with no marginal nerves and truncate irregular apex.

Merrillii: *Adonidia Merrillii.*

Muelleri: *N. Normanbyi.*

Normanbyi (*N. Muelleri. Areca, Cocos, Drymophlœus* and *Ptychosperma Normanbyi*). BLACK PALM. Stout tree to 60 ft., outer wood hard and black: lvs. 6–8 ft. long, the petiole short or none; pinnæ, or groups of about 9 narrow lobes, 1½ ft. long and 1 in. broad, whitish underneath: fls. spiral, the pistillate on lower part of branches: fr. about 1½ in. long, more or less pear-shaped.

NOTAPHŒBE: *Persea Borbonia.*

NOTHOFAGUS. *Fagaceæ.* Beech-like trees or shrubs but with small alternate lvs., unisexual fls. solitary or in 3's, and usually 3 3-angled nuts in a 2–4-lobed scaly involucre; native in S. S. Amer., Australia and New Zeal., the southern hemisphere representative of Fagus. Hardy only in warm regions, as Calif. Propagated by seeds and layers.

antarctica. To 100 ft.: lvs. deciduous, to 1 in. long, toothed or slightly lobed, glabrous except on midrib. Chile.

cliffortioides. To 40 ft.: lvs. evergreen, to ⅔ in. long, acute, entire, grayish-pubescent beneath. New Zeal.

Cunninghamii. To 200 ft.: lvs. evergreen, to ½ in. long, glabrous. Australia.

fusca. To 100 ft.: lvs. evergreen, to 1½ in. long, coarsely toothed, glabrous except on margin. New Zeal.

obliqua. To 100 ft.: lvs. deciduous, to 3 in. long, toothed. Chile.

procera. Tree: lvs. deciduous, to 4 in. long, finely toothed, pubescent beneath. Chile.

Solandri. To 80 ft.: lvs. evergreen, to ¾ in. long, obtuse, entire, grayish-pubescent beneath. New Zeal.

NOTHOLCUS (*Ginannia*). *Gramineæ.* Old World ann. and per. grasses of medium size, with flat lvs. and spikelets in terminal panicles; one species is sometimes planted for ornament. See *Grasses.*

lanatus (*Holcus lanatus*). VELVET-GRASS. Erect per. to 3 ft., prominently velvety-pubescent: lvs. to 6 in. long and ½ in. wide: panicles to 4 in. long, pale or purplish, glumes ciliate. Eu.; nat. in N. Amer.

NOTHOPANAX. *Araliaceæ.* Evergreen trees or shrubs from Malaya to New Zeal. with simple or compound lvs., small fls. in umbels, and drupaceous frs.; a few species are grown in Calif. for ornament.

anomalum (*Panax anomalum*). Shrub to 12 ft., much branched: lvs. orbicular, to ⅔ in. long, in young plants of 3 lfts.: fls. minute, in simple umbels: fr. mottled. New Zeal.

arboreum. Tree to 25 ft., much branched: lvs. digitately 5–7-parted into oblong toothed lfts. to 7 in. long: fls. ¼ in. across, in compound umbels: fr. purplish-black. New Zeal.

Colensoi. Shrub or tree to 15 ft.: lvs. of 3–5 obovate toothed lfts. to 6 in. long: fls. in compound umbels. New Zeal.

simplex. Tree to 25 ft.: lvs. lanceolate, to 5 in. long, in young plants lobed or pinnately parted: fls. small, in compound umbels. New Zeal.

NOTHOSCORDUM. FALSE GARLIC. *Liliaceæ.* Bulbous allium-like herbs with linear basal lvs. and small yellow or white fls. in umbels, the perianth-segms. distinct; rarely cult., the following species tender N.

bivalve. Lvs. to 16 in. long and ⅙ in. wide: fls. yellowish, ½ in. long, on scapes to 16 in. high. Va. to Fla. and Mex.

fragrans. Lvs. to 1 ft. long and ¾ in. wide: fls. white lined with pinkish, fragrant, to ½ in. long, on scapes to 2 ft. high. Habitat doubtful; nat. in Bermuda and S. U. S.

NOTOBASIS: *Cirsium syriacum.*

NOTONIA. *Compositæ.* Fleshy herbs or subshrubs with rudimentary or succulent lvs., allied to Senecio but with heads of disk-fls. only: heads red or yellow, solitary or in cymes: native trop. Afr. and Asia.

Grantii. To 8 in., root tuberous: radical lvs. elliptic, sessile, to ¾ in. long: heads orange-scarlet, ¾ in. long, on scape-like sts. bearing a few scale-like lvs. Trop. Afr.

NOTOTRICHIUM. *Amaranthaceæ.* Shrubs or trees, one sometimes planted in Calif.: lvs. opposite: fls. small, pubescent, in spikes: fr. a utricle.

sandwicense. KULUI. To 20 ft. or often a shrub: lvs. ovate, to 3 in. long, silvery-tomentose beneath: fls. crowded in 3–5 spikes to 1 in. long at ends of branches. Hawaiian Isls.

NUPHAR: *Nymphozanthus.*

NURSERY, in horticulture, is a place or establishment in which plants are propagated and then grown until such time as they are placed in permanent quarters or sold to the customer. It is naturally concerned mostly with perennial plants. The establishment may be wholly or partly under glass, or wholly in the open. It may be devoted to the rearing of orchids, begonias, roses, dahlias, lilies, lilacs, hedge plants, forest trees, fruit-trees, or any other class of vegetation. Nursery-growing practically constitutes a business or enterprise quite by itself, requiring special equipment, experience and market, and it has its own literature and traditions.

NUT: an indehiscent 1-celled and 1-seeded hard and bony fruit, even if resulting from a compound ovary. In horticulture an edible hardshelled fruit that can be kept in a dry state; see *Filbert, Hickory-Nut, Pecan, Walnut.*

NUTLET: a small or diminutive nut; nucule.

NUTMEG. One member, *Myristica fragrans*, of a large genus, is widely known for the seed which furnishes the nutmeg of commerce and the aril surrounding the seed which is commercial mace. Attractive tree to 70 feet: leaves alternate, oblong-lanceolate, to 5 inches long, brownish: flowers diœcious, without corolla: fruit reddish or yellowish, to 2 inches long, splitting into 2 valves, the scarlet mace forming a network around the brown seed or nutmeg. Molucca, but somewhat grown in parts of the American tropics.

The nutmeg thrives in a hot moist climate in well-drained rich soil. The plants are diœcious and one male is sufficient for ten to twelve females, although it is impossible to determine the sex before flowering. For this reason grafting is the best method of propagation although seeds are commonly employed. Seeds may be sown in bamboo pots and transplanted when seedlings are 8–10 inches high. A tree should come into bearing at seven to eight years of age and will remain productive for many years.

NUTMEG, CALIFORNIA-: *Torreya californica.*

NUTTALLIA: *Osmaronia, Mentzelia.*

NYCTAGINACEÆ. FOUR-O'CLOCK FAMILY. About 25 genera distributed widely about the world in warm and trop. countries; known to hort. chiefly in Buginvillæa, a genus of woody plants, Pisonia, and the herbaceous genera Abronia, Allionia and Mirabilis, grown for ornament. The family is characterized by its fls. subtended by an involucre which is sometimes petal-like and showy (as in Buginvillæa), petals lacking but calyx often or usually corolla-like (as in the four-o'clock), 1-celled 1-seeded ovary, the fr. an achene on which the calyx is persistent. The family is allied to Amaranthaceæ.

NYCTANTHES. *Oleaceæ.* One shrub or tree to 30 ft., native of India and sometimes grown under glass or in the open in warm countries, for its small night-blooming fls. Propagated by cuttings over heat. **N. Arbor-tristis.** NIGHT-JASMINE. TREE-OF-SADNESS. Lvs. opposite, ovate-cordate, to 4½ in. long: fls. salverform, white with orange tube, fragrant, in few-fld. heads subtended by involucre-like bracts: fr. an orbicular caps. ¾ in. long.

NYCTERINIA: *Zaluzianskya.*

NYCTOCEREUS. *Cactaceæ.* Slender erect or clambering somewhat branched Cereus-like cacti, sts. and branches cylindric and many-ribbed, spiny: fls. nocturnal, large and white, funnelform: species 5, in Mex. and Cent. Amer. See *Cacti.*

serpentinus (*Cereus serpentinus*). Clustered, at first erect and then clambering or hanging, to 10 ft. long and 2 in. thick, spines about 12: fls. 6–7½ in. long. Mex.—Widely cult.; one of the night-blooming cereuses.

NYMPHÆA (*Castalia*). NYMPHEA. WATER-LILY. *Nymphæaceæ.* Aquatic herbs with horizontal or erect rootstocks, sometimes tuberous, the lvs. usually floating and often colored on the under surface: fls. mostly showy, floating or standing near the surface, in white, yellow, pink, red or blue, some blooming by day and some by night: fr. under water, a single compound body of many divisions with a depressed saucer-like center: about 40 species and numerous hort. hybrids distributed widely in temp. and trop. regions.

Nympheas are propagated by seeds which are rolled up in a ball of clay and dropped into a pond, or sown in pots which are then submerged in shallow water, indoors or out. The more usual method is to use parts of rootstocks which are sunk in the pond and held by stones, or in the case of the tender species they are placed in pans of water indoors; the species that produce tubers on the rootstocks may be increased by this means.

advena: *Nymphozanthus advena.*

alba. EUROPEAN WHITE W. Robust: lvs. roundish, to 1 ft. across, red when young, crowded on the rhizome: fls. white, 4–5 in. across, open nearly all day. Eu., N. Afr. In var. **candidissima** the lvs. are yellowish when young, first to bloom in spring till frost. Var. **rubra,** rosy-red. Sweden.

Andreana. Hybrid between *N. alba* var. *rubra* and *N. mexicana.*

Arethusa. Hybrid between *N. alba* var. *rubra* and *N. mexicana:* fls. crimson-pink.

Arnoldiana. Hybrid between *N. rubra* and *N. Lotus:* fls. rosy-carmine.

aurora. Hybrid between *N. alba* var. *rubra* and *N. mexicana.*

Bissetii. Hybrid between *N. rubra* and *N. Lotus:* fls. magenta.

cærulea. BLUE LOTUS of Egypt. Tender, free-blooming but not showy: lvs. 12–16 in. across, green with purple blotches beneath: fls. 3–6 in. across, light blue with white center, opening 3 days in forenoon. N. and Cent. Afr.

candidissima: *N. alba* var.

capensis. CAPE BLUE W. Tender: lvs. to 16 in. across: fls. 6–8 in. across, sky-blue, whitish at bottom, opening 4 days in forenoon to late afternoon. S. Afr. Var. **zanzibariensis** (*N. zanzibariensis*). Lvs. often smaller; fls. larger, to 12 in., deep blue, opening and closing 3–5 days somewhat later, sepals purple-blue within and on margins. Zanzibar. Forms of this are azurea and rosea.

caroliniana (*N. odorata* var. *superba*). Hybrid between *N. odorata* var. *rosea* and *N. tuberosa:* fls. rosy-pink.

castaliflora: a hort. form with mottled lvs. and pink fragrant fls. to 10 in. across, day-blooming.

chromatella: *N. Marliacea* var.

chrysantha. Hybrid between *N. alba* var. *rubra* and *N. mexicana.*

colossea. Hybrid between *N. alba* and *N. odorata* var. *rosea:* fls. light pink.

columbiana. Hybrid between *N. rubra* and *N. Lotus:* fls. carmine.

Daubeniana. Possibly a hybrid of *N. micrantha* and *N. cærulea:* tender: fls. pale blue.

Deaniana. Hybrid between *N. rubra* and *N. Lotus:* fls. pink.

dentata: *N. Lotus* var.

devoniensis. Hybrid between *N. rubra* and *N. Lotus:* fls. rosy-carmine.

elegans. Lvs. 7 in. across, under surface dark purple: fls. pale violet, 3–6 in. across, open 3 days in the forenoon. Mex., Tex.

flava: *N. mexicana.*

flavovirens (*N. gracilis*). Tender: lvs. 15–17 in. across, green underneath: fls. 6–8 in. across, white, day-blooming. Mex.

formosa. Hybrid between *N. alba* var. *rubra* and *N. mexicana.*

Froebelii: a form probably of *N. alba* var. *rubra.*

fulva. Hybrid between *N. alba* var. *rubra* and *N. mexicana.*

gigantea. AUSTRALIAN W. Lvs. 18 in. across, under surface brownish-pink to purple: fls. light blue, petals tipped dark blue, open 7 days 9 A. M. to 6 P. M., 6–12 in. across. Australia. Var. **Hudsoniana** is listed.

Gladstoniana. Hybrid between *N. alba* and *N. odorata* var. *rosea*: fls. white.

gloriosa: a form of *N. alba* var. *rubra*

gracilis: *N. flavovirens.*

helvola: *N. tetragona* var.

indica. Hybrid between *N. rubra* and *N. Lotus:* fls. of different colors, of many named forms.

kewensis. Hybrid between *N. rubra* and *N. Lotus:* fls. rosy-pink.

Laydekeri. Hybrid between *N. alba* var. *rubra* and *N. tetragona* or *N. mexicana:* there are many named forms in different colors.

Lotus. WHITE LOTUS of Egypt. Tender: lvs. 12–20 in. across, dark green on top, brownish beneath: fls. 5–10 in. across, white with outer petals pinkish, opening evening till nearly next noon. Egypt. Var. **dentata.** Fls. white, 8–10 in. across, open till past noon. Cent. Afr. Large-fld. forms of this are **grandiflora, magnifica** and **superba.**

Luciana: improved form of the hybrid between *N. odorata* var. *rosea* and *N. tuberosa.*

lucida: form of the hybrid *N. Laydekeri* with red-crimson fls.

lutea: *Nymphozanthus luteus.*

Marliacea. A series of hybrids of different parentage raised by M. Latour-Marliac of France. Vars. **albida, carnea** and **rosea** are hybrids of *N. alba* and *N. odorata* var. *rosea.* Var. **chromatella** (*N. chromatella*). Hardy: floating lvs. much blotched with brown, 3–8 in. across, when crowded rise above water: fls. bright yellow, 3–6 in. across. Probably a hybrid between *N. mexicana* and *N. alba* or *N. tuberosa.* Hybrids between *N. alba* var. *rubra* and *N. tetragona* are vars. **flammea, ignea,** and **rubra punctata.**

mexicana (*N. flava*). YELLOW W. Rootstock erect and tuber-like, spreading by runners: floating lvs. 4–8 in. across, blotched brown above, crimson-brown with blackish dots beneath: fls. 4 in. across, standing 4–5 in. above the water, bright yellow, open before midday and early afternoon. Fla., Mex., but hardy N. protected under cult.

odorata. FRAGRANT W. Hardy: lvs. 3–10 in. across, rather thick, dull green above, usually purplish beneath: fls. white, fragrant, 3–5 in. across, opening 3 days in forenoon. Common in E. U. S. In the wild at Cape Cod is a pink-fld. var. **rosea,** in the S. and American tropics is a larger white-fld. var. **gigantea.** Var. **sulphurea** (*N. sulphurea*). Lvs. all floating, 4–6 in. across, like those of *N. odorata* but blotched with brown: fls. light yellow, 4–5 in. across, 2–4 in. above the water, open in morning. Probably *N. mexicana* × *N. odorata.*

Omarana. Hybrid between *N. rubra* and *N. Lotus:* fls. magenta.

Ortgiesiana rubra. Hybrid between *N. rubra* and *N. Lotus:* fls. magenta.

ovalifolia. Tender: lvs. narrowly elliptic, 10 in. long and 6 in. wide, large brown blotches above, under surface plain green: fls. deep blue, closed in dull weather. Trop. Afr.

pennsylvania. Hybrid between *N. cærulea* and *N. capensis* var. *zanzibariensis:* tender: fls. large, medium blue, open 8 A.M. to 5 P.M.

polysepala: *Nymphozanthus polysepalus.*

pulcherrima. Hybrid between *N. cærulea* and *N. capensis:* tender: under surface of lvs. green, densely blotched with purplish-black, margin purplish-red, 16 in. across: fls. light blue, 10–22 in. across.

pygmæa: *N. tetragona.*

Richardsoni: *N. tuberosa* var.

Robinsoni. Hybrid between *N. alba* var. *rubra* and *N. mexicana.*

rubicunda. Hybrid between *N. rubra* and *N. Lotus*: fls. reddish-pink.

rubra. RED INDIA W. Tender: lvs. 12–18 in. across, bronzy reddish-brown but becoming greenish, hairy beneath: fls. 6–10 in. across, deep purplish-red, opening 3 or 4 nights till nearly noon. India.—The parent of many hybrids

Seignoreti. Hybrid between *N. alba* var. *rubra* and *N. mexicana.*

speciosa. An improved form of the hybrid between *N. odorata* var. *rosea* and *N. tuberosa.*

stellata. BLUE LOTUS of India. Lvs. blue-violet beneath: fls. 3–7 in. across, pale blue, whitish at base (pink and white forms are known), opening 3 days in the forenoon and early afternoon. India.

Sturtevantii. Hybrid between *N. rubra* and *N. Lotus*: fls. reddish-pink.

sulphurea: *N. odorata* var.

superba: *N. caroliniana.*

tetragona (*N. pygmæa*). PYGMY W. Hardy, smallest species cult., has been used much in hybridization, contributing to the Marliacea, Laydeckeri and other hybrids: lvs. reddish beneath, 3–4 in. across: fls. white, 1½–2½ in. across, open 3 or 4 days from noon to 5 P.M. Siberia to Japan, also in N. Ida. and Ont. Var. **helvola** (*N. helvola*). Probably hybrid between *N. mexicana* and *N. tetragona.* Hardy: lvs. floating, 3–4 in. across, blotched all over with brown: fls. floating, small, yellow, 2 in. across, open during the afternoon.

tuberosa. MAGNOLIA or TUBEROUS W. Hardy: rootstocks bearing detachable short tuber-like branches: lvs. green beneath: fls. 4–9 in. across, pure white, opening 3 to 4 days till shortly after noon, faint or no fragrance. N. Amer. Var. **maxima** is a smaller form from N. J. Var. **Richardsoni,** more numerous petals, forming a globe when fl. fully open. The vars. **rosea** and **rubra** are forms of the hybrid between *N. odorata* var. *rosea* and *N. tuberosa.*

zanzibariensis: *N. capensis* var.

NYMPHÆACEÆ. WATER-LILY FAMILY. Per. aquatic herbs of wide distribution, with usually large floating lvs. that commonly arise from a submerged rootstock, bisexual regular showy or sometimes inconspicuous fls. having 4 or more sepals, few or many petals which pass into the numerous stamens, and fr. of separate or united carpels, the seeds sometimes discharged through apical apertures. The genera grown in ponds or aquaria are Brasenia, Cabomba, Euryale, Nelumbium, Nymphæa, Nymphozanthus, Victoria.

NYMPHOIDES (*Limnanthemum*). FLOATING-HEART. *Gentianaceæ* (or *Menyanthaceæ*). Aquatic perennials with broad floating lvs. heart-shaped at base and yellow or white fls.; grown in ponds or tubs.

Tubs should be filled two-thirds full of loam covered with sand and the remainder water. Propagated by pieces of the leaf containing flower-buds.

indicum. WATER SNOWFLAKE. Lvs. orbicular, to 8 in. across: fls. white, yellow toward base, borne in umbels at top of petioles. Tropics. Var. **aureum** is a deep yellow form.

lacunosum. Lvs. ovate-orbicular, 2 in. across, purplish beneath: fls. nearly white, ½ in. across, in umbels, accompanied by clusters of tubers. N. Amer.

nymphæoides: *N. peltatum.*

peltatum (*N. nymphæoides*). Lvs. ovate-orbicular, to 4 in. across, the margins wavy: fls. bright yellow, 1 in. across, in umbels in axils of lvs. Eu., Asia; sparingly nat. in N. Amer.

NYMPHOZANTHUS (*Nuphar*). COW-LILY. SPATTERDOCK. YELLOW POND-LILY. *Nymphæaceæ.* Aquatic plants with stout rootstocks creeping in the mud: lvs. large, some submerged, others floating or standing erect above the water: fls. not very attractive, yellow or purplish, usually standing above the water, the 5 or more sepals the showy part of the fl.

The spatterdocks grow on the margins of slow-running mud-bottom streams or lakes or in stagnant pools. Their cultivation and propagation is the same as for the hardy nympheas and nelumbos.

advena (*Nymphæa advena*). COMMON S. Lvs. 1 ft. long, thick: fls. 2–3 in. across, more or less globular, not wide open, yellow tinged green or brown, sepals 6. N. Amer.

luteus (*Nymphæa lutea*). European YELLOW P. Lvs. rising a little above the water or floating: fls. smaller than those of *N. advena,* yellow, somewhat fragrant, sepals 5. Eu.

polysepalus (*Nymphæa polysepala*). Lvs. to 1 ft. long and 14 in. wide: fls. 3–5 in. across, yellow, sepals 9–12. Calif. to Ore.

NYSSA. TUPELO. *Nyssaceæ.* N. American and Asian trees with alternate simple deciduous lvs. which turn scarlet in autumn, minute greenish-white unisexual fls., and small but conspicuous drupaceous frs.; sometimes grown for ornament in moist situations, prized also for the crooked brushy branching of some of the species.

Propagated by seeds sown at once or stratified, and by layers. Trees do not transplant well from the wild.

aquatica. COTTON or TUPELO GUM. To 100 ft.: lvs. to 7 in. long, entire or angular-toothed: fr. dark purple, 1 in. long, solitary. Swamps, Va. to Fla. and Tex.

biflora. Similar to *N. sylvatica* but with mostly obtuse rather than acute lvs. and much flattened ribbed stones. N. C. to Fla. and La.

multiflora: *N. sylvatica.*

sylvatica (*N. multiflora*). PEPPERIDGE. SOUR or BLACK GUM. To 100 ft.: lvs. to 4 in. long, entire: fr. dark blue, to ⅔ in. long, 1–3 together. Me. to Fla. and Tex.

NYSSACEÆ. NYSSA FAMILY. Three genera of trees and shrubs native in N. Amer. and Asia, with alternate simple lvs., bisexual or diœcious fls. having very small calyx, 5 or more petals or lacking, inferior 1- or 6–10-celled ovary, and mostly drupaceous fr. Camptotheca, Davidia and Nyssa are cult.

O

OAK: *Quercus.* **Jerusalem-:** *Chenopodium Botrys.* **Poison-:** *Rhus diversiloba* and *R. Toxicodendron.* **She-:** *Casuarina.* **Silk-:** *Grevillea robusta.* **Tanbark:** *Lithocarpus densiflora.*

OAKESIA: *Uvularia sessilifolia.*

OAKESIELLA: *Uvularia sessilifolia.*

OAT, FALSE: *Trisetum.*

OATS: *Avena.*

OBELISCARIA: *Lepachys columnaris* var.

OBLONG: a rather broad leaf or other part, longer than wide and with the sides nearly or quite parallel most of their length.

OBTUSE: blunt, rounded, not pointed.

OCEANORUS: *Zygadenus leimanthoides.*

OCHNA. *Ochnaceæ.* Trop. trees and shrubs in both hemispheres with alternate toothed leathery lvs., yellow fls., and fr. of sessile drupes surrounding a central receptacle.

One species is grown under glass or out-of-doors in southern California. The best soil in greenhouse culture is fibrous loam well drained. Propagated by cuttings of half-ripened wood in summer or fall.

multiflora. Shrub to 5 ft.: lvs. oblong, to 5 in. long: fls. yellow, the sepals turning red: fr. with bright red receptacle and black seed-like drupes. Trop. Afr.

OCHNACEÆ. OCHNA FAMILY. About 20 trop. woody genera with alternate simple or pinnate lvs., bisexual polypetalous fls. with mostly 5 sepals and petals, 10 or more stamens, deeply lobed ovary, and fr. a drupe, berry or caps. The family is near Hypericaceæ in the series. Ochna is sometimes planted.

OCHROCODON: *Fritillaria pudica.*

OCHROMA: see *Bombacaceæ.*

OCIMUM. *Labiatæ.* Ann. or per. very aromatic herbs or small shrubs, the basil grown for seasoning and for the pleasing fragrance: fls. mostly small, in terminal or branching racemes.

Basils are sweet herbs tender in the North and should be started indoors or in a hotbed; otherwise they are easily grown. The herbage is cut while the plant is growing and dried, and often a second crop is obtained. The roots may be lifted for a winter supply of foliage.

Basilicum. BASIL. Ann. or grown as such, much branched, to 2 ft.: lvs. ovate, to 2 in. long, often purplish: fls. white or purplish, to ½ in. long. Trop. Asia, Afr., Pacific Isls.

minimum. BUSH BASIL. Probably a small form of *O. Basilicum.*

suave. TREE BASIL. Shrub to 8 ft., much branched: lvs. ovate, densely woolly: fls. whitish or purplish, ¼ in. long, in dense and much-panicled racemes to 9 in. long. India, Afr.

OCONEE-BELLS: *Shortia galacifolia.*

OCOTILLO: *Fouquieria splendens.*

OCTOMERIA. *Orchidaceæ.* S. American epiphytes with tufted sts., solitary lvs. and small fls. clustered in the axils of lvs., the sepals and petals similar, the lip 3-lobed. See *Orchids* for cultural notes.

diaphana. To 6 in.: lvs. lanceolate, to 3 in. long: fls. transparent yellowish-white with red spot at base of lip, about ½ in long, May. Brazil.

ODONTIODA. *Orchidaceæ.* A group of orchid hybrids between the genera Odontoglossum and Cochlioda.

Bradshawiæ (*O. crispum* × *C. Noezliana*).

Brewii (*Odontioda Charlesworthi* × *Odontoglossum Harryanum*).

Charlesworthi (*O. Harryanum* × *C. Noezliana*).

Cooksoniæ (*O. armainvillierense* × *C. Noezliana*).

keighleyensis (*O. cirrhosum* × *C. Noezliana*).

Sanderæ (*O. percultum* × *C. Noezliana*).

Thwaitesi (*O. Harryanum* × *C. vulcanica*).

Vuylstekeæ (*O. nobile* × *C. Noezliana*).

ODONTOGLOSSUM. *Orchidaceæ.* Epiphytic trop. American orchids with 1- or 2-lvd. pseudobulbs and fls. in racemes or panicles, the sepals and petals nearly equal, the lip with claw parallel to column and spreading midlobe. The cult. species are mostly native in high elevations and are usually difficult to grow in N. Amer. because of the hot summers; they require a cool house. See remarks under *Orchids.*

Adrianæ. Hybrid between *O. crispum* and *O. Hunnewellianum.*

Aireworthi. Hybrid between *O. crispum* and *O. Japonais.*

Aliciæ. Hybrid between *O. Edwardi* and *O. spectabile.*

altum. Hybrid between *O. armainvillierense* and *O. Hallii.*

amabile. Hybrid between *O. spectabile* and *O. crispum.*

amandum. Hybrid between *O. Denisonæ* and *O. nobile.*

amœnum. Hybrid between *O. nobile* and *O. sceptrum.*

Andersonianum: *O. crispum* var.

ardentissimum: *O. armainvillierense.*

armainvillierense (*O. ardentissimum*). Hybrid between *O. nobile* and *O. crispum.*

Ashworthianum. Hybrid between *O. Edwardi* and *O. Ossultoni.*

bictoniense. Pseudobulbs with 2 lvs. to 16 in. long: fls. 1½ in. across, in many-fld. racemes to 3 ft. high; sepals and petals yellowish-green spotted with brown; lip violet with 2 yellow crests, Nov.–Apr. Cent. Amer.

Cervantesii. Pseudobulbs with 1 lf. to 6 in. long: fls. white with yellow claw, 2 in. across. in 2–5-fld. racemes to 8 in. long, Nov.-Mar. Mex. to Guatemala.

cirrhosum. Pseudobulbs with 1 lf. to 8 in. long: fls. white spotted with red-brown, 3 in. across, in many-fld. drooping panicles to 2 ft. long, Apr.–May. Ecuador.

citrosmum: *O. pendulum.*

Coradinei. Perhaps a natural hybrid: fls. deep yellow spotted with brown, to 3 in. across, in many-fld. racemes. Colombia.

cordatum. Pseudobulbs with 1 lf. to 8 in. long: fls. in 5–8-fld. racemes to 16 in. long; sepals and petals yellow spotted with brown; lip white spotted with brown and with 2 yellow crests, July–Aug. Mex.

Crawshayanum. Hybrid between *O. Hallii* and *O. Harryanum.*

crispodinei. Hybrid between *O. crispum* and *O. Coradinei.*

crispum. Pseudobulbs with 2–3 lvs. to 16 in. long: fls. white spotted with brown and with yellow throat, wavy-margined, to 3 in. across, in 8–20-fld. panicles, Oct.–Feb. Colombia. Var. **Andersonianum** (*O. Andersonianum*) has yellowish fls. spotted with brown.

Denisonæ (*O. Wilckeanum*). Hybrid between *O. crispum* and *O. luteo-purpureum.*

Edwardi. Pseudobulbs with 2 lvs. to 2 ft. long and 1½ in. wide: fls. purple with yellow callus, about 1 in. across, in many-fld. panicles to 2½ ft. high, Apr.–June. Ecuador.

Edwardinum. Hybrid between *O. Edwardi* and *O. eximium.*

excellens. Hybrid between *O. nobile* and *O. triumphans.*

eximium. Hybrid between *O. armainvillierense* and *O. crispum.*

Fletcherianum. Hybrid between *O. Edwardi* and *O. cirrhosum.*

grande. Pseudobulbs with 2 lvs. to 1 ft. long and 3 in. wide: fls. yellow spotted with brown, to 5 in. across, in 3–6-fld. racemes to 16 in. long, the lip wavy, Oct.–Dec. Guatemala.

Hallii. Pseudobulbs with 2–3 lvs. to 1 ft. long: fls. to 4 in. across, in many-fld. racemes to 3 ft. high; sepals and petals dark yellow with large brown spots: lip white with brown spot in center, toothed, Mar.–June. Ecuador, Colombia.

Harryanum. Pseudobulbs with 2 lvs. to 1 ft. long: fls. in 4–12-fld. racemes to 3 ft. high; sepals and petals dark brown veined and spotted with lighter; lip violet at base veined with yellow, white at tips, wavy, July–Nov. Colombia.

harvengtense (*O. loochristiense*). Hybrid between *O. crispum* and *O. triumphans.*

hastilabium. Pseudobulbs with 2 lvs. to 1 ft. long: fls. in panicles to 4 ft. high; sepals and petals light green spotted with red-brown; lip violet with white midlobe, Apr.–July. Colombia.

hellemense. Hybrid between *O. harvengtense* and *O. crispum.*

Holmesii. Hybrid between *O. spectabile* and *O. Adrianæ.*

Hunnewellianum. Pseudobulbs with 2–3 lvs. to 1½ ft. long: fls. yellow spotted with brown, 2 in. across, in 10–25-fld. racemes, the lip curled, Oct.–Apr. Colombia.

illustrissimum. Hybrid between *O. armainvillierense* and *O. Japonais.*

Insleayi. Pseudobulbs with 2 lvs. to 1 ft. long: fls. yellow spotted with red-brown, to 4 in. across, in racemes longer than lvs., Aug.–Sept. Mex.

læve: *Miltonia lævis.*

Japonais (*O. Lambeauianum*). Hybrid between *O. Rolfeæ* and *O. crispum.*

Lambeauianum: *O. Japonais.*

Lobbi. Hybrid between *O. amabile* and *O. nobile.*

loochristiense: *O. harvengtense.*

luteo-purpureum. Pseudobulbs with 2–3 lvs. to 1 ft. long: fls. to 3 in. across, in many-fld. racemes, yellow with large brown or purple spots, the lip fringed, Mar.–June. Colombia.

maculatum. Pseudobulbs with 1 lf. to 8 in. long: fls. to 3 in. across, in many-fld. drooping racemes longer than lvs.; sepals brown; petals and lip yellow spotted with brown, June–July. Mex.

mirificum. Hybrid between *O. crispum* and *O. sceptrum.*

nebulosum. Pseudobulbs with 2 lvs. to 8 in. long and 2 in. wide: fls. white spotted with red-brown in center, to 2½ in. across, in 5–7-fld. racemes to 1 ft. long, May–June. Mex.

nitidum. Cross between the hybrids *O. spectabile* and *O. Denisonæ.*

nobile (*O. Pescatorei*). Pseudobulbs with 2 lvs. to 1 ft. long: fls. white, the lip often spotted with red-purple, 2 in. across, in panicles to 3 ft. long, Mar.–May. Colombia.

Oberthuri. Hybrid between *O. Adrianæ* and *O. harvengtense.*

Ossultoni. Hybrid between *O. spectabile* and *O. nobile.*

pendulum (*O. citrosmum*). Pseudobulbs with 2 lvs. to 1 ft. long and 3 in. wide: fls. white or rosy with rose-colored lip, 3 in. across, in many-fld. racemes to 16 in. long, Sept., Mar. Mex.

Pescatorei: *O. nobile.*

pulchellum. Pseudobulbs with 2 lvs. to 1 ft. long: fls. fragrant, white except the base of the lip which is yellow spotted with red, about 1 in. across, in 8–10-fld. racemes to 1 ft. long, Oct.–Dec. Costa Rica, Guatemala.

Rolfeæ. Hybrid between *O. nobile* and *O. Harryanum.*

Rossii. Pseudobulbs with 1 lf. to 5 in. long and 1 in. wide: fls. 2 in. across, in 1–3-fld. racemes about length of lvs.; sepals yellow thickly spotted with red-brown; petals white spotted brown at base; lip white with yellow claw, Feb.–Apr. Mex. Var. **majus** is a hort. form.

sceptrum. Often treated as a var. of *O. luteo-purpureum:* fls. creamy-yellow, the petals spotted with brown, lip whitish. Colombia.

Schlieperianum. Pseudobulbs with 2 lvs. to 1 ft. long: fls. yellow spotted at base with brown, 3½ in. across, July–Sept. Costa Rica. Var. **album** has white fls.

Thompsonianum. Hybrid between *O. Edwardi* and *O. crispum.*

tigrinum. Hybrid between *O. Fascinator* and *O. Harryanum.*

triumphans. Pseudobulbs with 2–3 lvs. to 1 ft. long: fls. dark yellow spotted with brown, the lip white at base, 3 in. across, in 10–20-fld. racemes to 1½ ft. high, Mar.–May. Colombia.

triumphosum. Hybrid between *O. triumphans* and *C. cirrhosum.*

Uroskinneri. Pseudobulbs with 1–2 lvs. to 10 in. long: fls. 2½ in. across, in 10–15-fld. racemes; sepals and petals dark brown mottled with dark green; lip rose with 2 white crests, July–Sept. Guatemala.

Vuylstekei. Hybrid between *O. Denisonæ* and *O. triumphans.*

warnhamense. Hybrid between *O. Hallii* and *O. nobile.*

Wilckeanum: *O. Denisonæ.*

Williamsianum. Natural hybrid between *O. grande* and *O. Schlieperianum.*

ODONTONEMA (*Thyrsacanthus*). *Acanthaceæ.* Trop. American herbs and shrubs with opposite entire lvs. and red tubular 5-lobed or 2-lipped fls. in terminal spike-like racemes; three species are grown in S. U. S. and sometimes under glass. Propagated by cuttings.

callistachyum. Shrub to 15 ft.: lvs. oblong to elliptic-ovate, to 1 ft. long: fls. red or pink, to 1¼ in. long, in raceme-like panicles. Mex., Cent. Amer.

Schomburgkianum (*T. rutilans*). Shrub to 6 ft.: lvs. oblong-lanceolate: fls. red, 1½ in. long, in drooping racemes to 3 ft. long. Colombia.

strictum. Shrub to 6 ft.: lvs. oblong, to 6 in. long, often wavy-margined: fls. crimson, to 1 in. long, with short lobes, in erect close long infl. Cent. Amer.—Sometimes grown as *Justicia coccinea.*

ODONTONIA. *Orchidaceæ.* A group of hybrids between the genera Odontoglossum and Miltonia.

Lairesseæ (*O. crispum* × *M. Warscewiczii*).

ODONTOSORIA. *Polypodiaceæ.* Trop. ferns formerly included with Davallia but differing in characters of the indusium. One is readily grown under glass. See *Ferns.*

chinensis (*Davallia tenuifolia. O. tenuifolia*). Lvs. to 1½ ft. long and 9 in. wide, 3–4-pinnatifid into fine segms. about ⅛ in. long. Trop. Asia, Polynesia.

tenuifolia: *O. chinensis.*

ODOSTEMON: *Mahonia.*

ŒNOTHERA. *Onagraceæ.* Herbs, ann., bien., per., of wide distribution but mostly in western hemisphere, including the evening-primroses that open late in the day and close in morning (nocturnal), and the sundrops that remain open in the day (diurnal) and make attractive flowering clumps; some of the evening-primroses have very large fls. and are interesting for the sudden opening of the corolla and the attracting of nocturnal moths. The prevailing color in Œnothera is yellow but there are red and pink kinds, and fls. of some species open nearly or quite white and change to rose. The group is separated by some authors into about a dozen genera but it is here kept together, as Anogra, Hartmannia, Kneiffia, Lavauxia, Megapterum, Meriolix, Pachylophus, Raimannia, Sphærostigma. Some of these plants, particularly the *Œ. biennis* group (incl. *Œ. Lamarckiana*), have been the subjects of extensive studies in mutation.

Œnotheras are sun-loving dry-land plants of simple cultivation, commonly grown from seeds or the clumps of the perennial kinds may be divided. Some of them are tall erect plants to 2 or 3 feet, and others are stemless; a number of them are more or less prostrate. Some of the decumbent and stemless kinds are useful in the rock-garden.

acaulis (*Œ. taraxacifolia*). Dandelion-leaved Sundrop. Bien. or per., stemless at first but making prostrate branches: lvs. pinnatifid, with large terminal segm.: fls. to 4 in. across, white to blush, long-tubed, shorter than radical lvs.: fr. short, 4-winged at top, short-stalked or nearly sessile. Chile.—This species is Burbanks "America."

America: *Œ. acaulis.*

Berteriana (*Raimannia Berteriana*). Erect to 2 ft., ann. or bien., hairy: lvs. narrow-lanceolate to oblong-lanceolate, more or less crenate and undulate, upper ones nearly or quite sessile: fls. nocturnal, yellow, 1 in. or more across: fr. linear, 1½ in. long. Chile, Argentina.

biennis (*Onagra biennis*). Common Evening-Primrose. Tall coarse variable simple or branched erect weedy bien. to 6 ft., in old fields and waste places and nat. in Eu. and elsewhere: lvs. lance-ovate or narrower: fls. 1–2 in. across, nocturnal, yellow: fr. oblong, to 1½ in. Var. **grandiflora** is a larger-fld. form, in southern states, sometimes regarded as a distinct species; forms in the trade under this name need special study.

bistorta. Rather showy ann. lightly pubescent sundrop, ascending, 10–16 in.: lvs. narrow-lanceolate to ovate, denticulate: fls. to 1 in. across, yellow, with purple spots in center: fr. about ¾ in. or more long, somewhat 4-sided, not beaked. S. Calif. Known in cult. mostly in the var. **Veitchiana** (*Œ. Veitchiana. Sphærostigma Veitchianum*), which differs in having a longer less angled beaked pod.

brachycarpa (*Lavauxia brachycarpa*). Stemless pubescent per.: lvs. long and narrow, thickish, pinnatifid to entire: fls. yellow, 2 in. or more across, long-tubed: fr. sessile on the crown, short, winged. Kans., northwest and southwest.

cæspitosa (*Pachylophus cæspitosa*). Nearly or quite stemless bien. or per. with woody root: lvs. pubescent, narrow, sinuate or dentate to pinnatifid: fls. to 3 in. across, white or pink: fr. short, tuberculate and winged. S. D., west and south.

californica (*Œ. pallida* var. *Anogra californica*). Ascending per. from a rootstock, 20 in. or less, hoary-pubescent: lvs. narrow-oblanceolate, dentate or pinnatifid: fls. white turning pink, 2 in. more or less across, remaining open in early morning: fr. linear and ribbed, to 2 in. long. Calif.—Another *Œ. californica* or *Eulobus californicus* is properly *Œ. leptocarpa*, apparently not cult.; it is an erect hairy ann. with small yellow or orange fls. that frequently have reddish spots inside.

campylocalyx (sometimes written *campylocarpa. Œ. coccinea. Œ. versicolor*). Ann. or bien., erect to 2½ ft., simple or branched, more or less pubescent: lvs. linear-lanceolate, nearly or quite sessile, denticulate: fls. 1 in. or more across, nocturnal, red with yellowish margins: fr. short, oblong, sessile, hairy. Bolivia, etc.

cheiranthifolia: *Œ. spiralis.*

Childsii: *Œ. tetraptera.*

cinnabarina: see *Œ. odorata.*

coccinea: *Œ. campylocalyx, Œ. rosea.*

Cockerellii. Erect very leafy bien., 2–3 ft., more or less pubescent or hirsute: lvs. lanceolate, entire or somewhat denticulate: fls. light yellow, nocturnal, 1 in. or more across: fr. narrow-oblong, sessile, about 1 in. long. Colo.

consolida: see *Œ. odorata.*

coronopifolia (*Anogra* and *Raimannia coronopifolia*). Erect branched gray-pubescent per. to 2 ft.: lvs. narrow, deeply pinnatifid into narrow lobes: fls. diurnal, white turning pink, 1 in. or more across, buds drooping: fr. oblong, pubescent. Kans., north and west.

cruciata (*Œ. biennis* var. *cruciata*). Erect mostly simple glabrous or slightly hairy ann., to 4 ft.: lvs. lanceolate to long-oblong, remotely denticulate or entire: fls. yellow, small, about ¾ in. across, nocturnal, the petals about as narrow as sepals: fr. oblong-angled, sessile, about 1 in. long. New England, N. Y.

densiflora: *Boisduvalia densiflora.*

dentata (*Sphærostigma dentatum*). Ann. to 9 in., branched, glabrous or nearly so: lvs. linear, to nearly 2 in. long: fls. yellow changing to reddish, small. Calif. to Chile.

Drummondii (*Raimannia Drummondii*). Diffuse hairy-pubescent ann., sts. rising 1–2 ft.: lvs. mostly lance-oblong, denticulate to entire: fls. yellow to cream-color, 2–3 in. across, delicate and attractive, nocturnal: fr. linear, 1–2 in. long. Tex.

eximia (*Pachylophus eximius*). Leafy per. to 1 ft. high: lvs. oblanceolate to spatulate, dentate or lobed, hairy at least on margins: fls. white turning pink, 2 in. or more across, nocturnal: fr. narrow-ovoid, to 1½ in. long. Colo. to New Mex.—Much like *Œ. cæspitosa.*

floribunda: *Œ. riparia.*

Fraseri: *Œ. glauca* var.

fruticosa (*Œ. serotina. Kneiffia fruticosa*). Per. sundrop, becoming semi-woody at base, 1–3 ft. tall, sts. reddish, nearly glabrous to thinly hairy: lvs. lanceolate to oval-lanceolate, sparsely denticulate to entire, often short-stalked: fls. to 2 in. across, showy, yellow: fr. short-oblong, winged, about ⅓ in. long, glabrous or with glandular hairs. N. S., south and west, on dry land. Var. **major** is very floriferous and makes a bushy plant. Var. **Youngii** (*Œ. Youngii*), strong and stocky, profuse bloomer: lvs. mostly large, shiny and slightly glaucous.

glabra: perhaps *Œ. biennis.*

glauca (*Kneiffia glauca*). Sundrop much like *Œ. fruticosa* but glabrous and somewhat glaucous, fr. longer and broadly winged, lvs. sessile, ovate or oval. Va. and Ky. south. Var. **Fraseri** (*Œ. Fraseri*) has rather ovate-lanceolate and mostly slightly stalked lvs.

grandiflora: *Œ. biennis* var.

Hookeri. Bien., of the *Œ. biennis* group, to 4 ft., canescent or hairy: lvs. ovate to oblanceolate, to 9 in. long: fls. yellow, nocturnal, the petals to 2 in. long and as broad. Calif.

imperialis: the plant so grown is probably one of the *Œ. fruticosa* group.

Johnsoni. The true *Œ. Johnsoni* (properly *Œ. primiveris*), acaulescent and with pinnatifid lvs., of W. N. Amer., is apparently not in cult.; the ornamental large-fld. sweet-scented plant grown under this name is one of the *Œ. Lamarckiana* group: fls. opening in evening and closing next forenoon or midday; calyx reddish; bien. to 4 ft., but mostly blooming first year from seed.

laciniata (*Œ. sinuata. Raimannia laciniata*). Diffuse bien. or per., thinly hairy to glabrous, to 2 ft. high: lvs. narrow, sinuate-dentate to pinnatifid: fls. pale yellow, mostly small and not showy, nocturnal: fr. linear, to 1½ in. long. N. J. to S. D., Fla. and Mex. Var. **grandiflora** has fls. 2 in. or more across. Mo., Kans. to Tex.

Lamarckiana. Much like a large-fld. *Œ. biennis*, but sts. red-tuberculate, lvs. broad and crinkled, fl.-buds densely pilose and viscid, stigmas longer. Unknown wild; an old garden plant seen in various forms.

leptocarpa: see *Œ. californica.*

linearis (*Kneiffia linearis*). Slender bien. or per. sundrop, to 20 in., nearly glabrous to hairy: lvs. variously spatulate to narrow-lanceolate, nearly or quite entire: fls. bright yellow, to 1¾ in across, but usually smaller: fr. club-shaped, pubescent and not glandular. Conn. to Ga.

longiflora: see *Œ. odorata.*

macrantha. The plant grown under this name is one of the *Œ. Lamarckiana* group.

macrocarpa: *Œ. missouriensis.*

micans: see *Œ. odorata.*

missouriensis (*Œ. macrocarpa. Megapterium missouriense*). Canescent per. with sts. ascending to about 1 ft.: lvs. narrow-oval to lanceolate to broad-linear, denticulate or entire: fls. yellow, 4–6 in. across, long-tubed, showy: fr. becoming 2–3 in. long and nearly as broad, widely winged. Neb. and Mo. west and south.

mollissima. Ann. or grown as such in gardens, to 2½ ft., branched, loosely hairy: lvs. linear-lanceolate, to 3 in. long, remotely denticulate to entire: fls. nocturnal, small, yellow, about ¾ in. across. Argentina.—The plant grown under this name is weedy and not very attractive, and some of the stock passing as *Œ. Sellowii* and *Œ. villosa* are apparently the same.

muricata: *Œ. parviflora.*

odorata. Ann. or so grown, erect, branched, to 4 ft., glabrous to sparsely hairy: lvs. long-linear-lanceolate, or the upper ones lance-ovate, remotely toothed, crisped: fls. nocturnal, yellow fading to reddish, fragrant, 1–2½ in. across. Chile.—Plants sometimes grown as *Œ. cinnabarina, consolida, longiflora, micans, prostrata, suaveolens, undulata*, apparently belong here, although the botanical species bearing these names may be quite different.

parviflora (*Œ. muricata*). Like *Œ. biennis* but usually not as tall and less branched: lvs. rather thick and glabrous or only thinly hairy, tip of sepals separated in bud (rather than in contact), upper bracts persistent and equalling or exceeding the pods. Northeastern states to Newf.

perennis (*Œ. pumila. Œ. pusilla. Kneiffia pumila*). Small or slender finely pubescent per. sundrop, sometimes to 2 ft. but commonly lower and often blooming when 2 in. high: lvs. oblanceolate or oblong, entire: fls. yellow, 1 in. or less across: fr. short, club-shaped, short-stalked or sessile. Newf. to Ga., Man. and Kans.

Pilgrimii: form of *Œ. perennis.*

pratensis (*Kneiffia pratensis*). Attractive stoloniferous sundrop, per. to 2 and 3 ft., soft-hairy: lvs. oblong-lanceolate or somewhat elliptic, sinuate or entire: fls. yellow, profuse and showy, to 2 in. across, buds purplish: fr. short, club-shaped. Me. to Ark.

prostrata: see *Œ. odorata.*

pumila: *Œ. perennis.*

pusilla: *Œ. perennis.*

rhizocarpa: *Œ. triloba.*

riparia (*Œ. floribunda. Kneiffia riparia*). Like *Œ. linearis*, but more pubescent and the fls. larger (to about 2 in. across), floriferous. Near coast, L. I. to Ga.

rosea (*Œ. coccinea* of lists. *Hartmannia rosea*). Low diffuse bien. or per., blooming first year from seed, finely pubescent, sts. slender and 1–2 ft. long: lvs. ovate-lanceolate or narrower, sparsely denticulate or entire, small: fls. small and not showy, ½ in. or less across, rose-purple, opening at evening and remaining to next day: fr. club-shaped, long-tapering. Tex. and New Mex. to S. Amer.

rubricalyx. AFTERGLOW EVENING-PRIMROSE. Form of *Œ. Lamarckiana* or derivative from it, with attractive red calyx-tube.

Sarrazinii: *Œ. tetraptera.*

Sellowii: see *Œ. mollissima.*

serotina: *Œ. fruticosa.*

serrulata (*Meriolix serrulata*). Erect mostly finely pubescent per. or bien., more or less woody at base, to 1½ ft. high: lvs. mostly linear, sharply dentate: fls. yellow, diurnal, to 2 in. across, petals crenulate: fr. linear, canescent. Man. to Tex. and New Mex.

sinuata: *Œ. laciniata.*

speciosa (*Hartmannia speciosa*). Erect or ascending finely pubescent per.: lvs. linear to lance-oblong, sinuate, dentate or pinnatifid: fls. diurnal, white or whitish changing to pink, to 3 in. across: fr. club-shaped, 4-ribbed. Mo. west and south, and nat. eastward; showy.

spiralis (*Œ. cheiranthifolia. Sphærostigma spiralis*). Prostrate or somewhat ascending tap-rooted per., with oblong to oblanceolate white-pubescent lvs.: fls. yellow, about 1 in. across: fr. nearly linear, short, coiled. Coasts, Calif.

suaveolens: see *Œ. odorata.*

taraxacifolia: *Œ. acaulis.*

tetraptera (*Œ. Sarrazinii. Œ. Childsii. Hartmannia tetraptera*). Decumbent, diffuse or erect thinly hairy ann. to 20 in.: lvs. lanceolate to narrow-ovate, coarsely toothed to pinnatifid: fls. whitish becoming rose or rose from the first, diurnal, to 3 in. across, showy: fr. 1 in. or more long with long st.-like base, ridged. Tex. to Ariz. to S. Amer.

trichocalyx (*Anogra trichocalyx*). Bien. or per. to 12 in. high, silky-hairy: lvs. linear or nearly so to lanceolate or ovate, usually sinuate-pinnatifid, to 2 in. long: fls. white, petals to 1¼ in. long, the buds nodding. Colo. and Wyo., Utah.—Variable.

triloba (*Œ. rhizocarpa. Lavauxia triloba*). Per., stemless, slightly pubescent or glabrate, with dandelion-like lvs., blooming first year from seed: fls. white or pink, to 2½ in. across, very long and slender tubed, shorter than lvs.: fr. short, winged, in a cluster at the crown. Ky. and Tenn. to Calif. and Mex.

undulata: see *Œ. odorata.*

Veitchiana: *Œ. bistorta* var.

versicolor: *Œ. campylocalyx.*

villosa. S. African, considered to be *Œ. biennis* nat. there, but plants grown under this name may be *Œ. mollissima.*

viridescens (*Œ. spiralis* var. *viridescens. Sphærostigma viridescens*). Tap-rooted bien. or per., green, sts. 1½–2½ ft. prostrate or ascending: lvs. thickish, round-ovate and cordate, hairy, denticulate: fls. yellow becoming greenish, 1 in. or less across: fr. linear, 4-angled, coiled. Seashore, S. Calif.

Whitneyi: *Godetia grandiflora.*

Youngii: *Œ. fruticosa* var.

OKA: *Oxalis crenata.*

OKRA, GUMBO. The large green erect pods of *Hibiscus esculentus.* From these pods is made the well-known gumbo soup of the South, where the plant is more extensively grown than in the North. The pods are also employed in their green state for stews, and are dried and used in winter, when they are nutritious and form no little part of the diet in certain sections of the country. The seeds are sensitive to cold and moisture, and should not be sown until the ground has become warm. The seed should be sown in a drill 1 inch deep, the plants thinned to 12 inches in the row for the dwarf varieties and 18–36 inches for the tall varieties; the rows are usually far enough apart to admit of horse tillage. One ounce of seed supplies 50–100 feet of drill, depending on the thickness of sowing. The tall kinds reach 4–7 feet. The culture given corn or cotton is suitable.

OLD MAN: *Artemisia Abrotanum* **-and-Woman:** *Sempervivum tectorum.* **-Mans-Beard:** *Clematis Vitalba.* **Woman:** *Artemisia Stelleriana.*

OLEA. OLIVE. *Oleaceæ.* Evergreen trees or shrubs native in eastern hemisphere with opposite commonly entire lvs. silvery-scurfy underneath, small white or whitish unisexual or bisexual fls. in panicles, and fr. a drupe, usually 1-seeded. One species is grown widely for the edible fr. and others for ornament in Calif. and other mild climates. See *Olive*.

Aquifolium: *Osmanthus ilicifolius.*

chrysophylla. Small tree: lvs. lanceolate, to 4 in. long, yellow beneath: fr. globose, blackish. Trop. Afr.

communis: see *O. europæa.*

Cunninghamii. To 70 ft.: lvs. variable, linear to ovate-lanceolate, to 10 in. long: fr. ovoid, about ½ in. long, red. New Zeal.

europæa. COMMON O. To 25 ft.: lvs. oval to lanceolate, to 3 in. long, silvery-scaly beneath: fls. fragrant: fr. oblong, to 1½ in. long, shining black when ripe. Medit. region.—Grown for fr. in Calif. and for ornament and curiosity in Fla. and elsewhere. The wild form has been distinguished as var. **Oleaster**, with thorny branches, and the cult. olive as var. **communis**.

fragrans: *Osmanthus fragrans.*

ilicifolius: *Osmanthus ilicifolius.*

lanceolata. To 50 ft., diœcious: lvs. linear to ovate-lanceolate, to 6 in. long: fr. ovoid, ½ in. long, red or orange. New Zeal.

montana. To 50 ft., diœcious: lvs. linear or linear-lanceolate, to 3½ in. long: fr. ovoid, red, to ⅓ in. long. New Zeal.

OLEACEÆ. OLIVE FAMILY. Widely distributed trees and shrubs in trop. and temp. regions in both hemispheres, of more than 20 genera, grown for ornament and shade, and the olive for the edible fr.: lvs. prevailingly opposite, simple or pinnate: fls. regular, bisexual or unisexual, having commonly 4-lobed calyx and corolla, the latter gamopetalous (sometimes apetalous in Fraxinus), 2 stamens, superior 2-celled ovary: fr. a berry, drupe, caps. or samara. Genera herein treated are Chionanthus, Fontanesia, Forestiera, Forsythia, Fraxinus, Jasminum, Ligustrum, Menodora, Nyctanthes, Olea, Osmanthus, Phillyrea, Syringa.

OLEANDER: *Nerium.* **Yellow**: *Thevetia nereifolia.*

OLEARIA (*Shawia*). TREE ASTER. DAISY-TREE. *Compositæ.* Evergreen shrubs and small trees with mostly alternate lvs. tomentose beneath and heads of white, blue or purple ray- and disk-fls. solitary or in corymbs or panicles; pappus of bristles; native in New Zeal. and Australia. Several species are grown out-of-doors in Calif. for ornament. Propagated by cuttings of half-ripened shoots, as well as by seeds.

albida. Tree to 20 ft.: lvs. oblong or ovate-oblong, to 4 in. long, entire, white-tomentose beneath: heads of 3–6 fls., ¼ in. long, in large panicles. New Zeal.

angulata. Shrub to 12 ft.: lvs. oblong or oval, to 2½ in. long, white-tomentose beneath, undulate: heads of 3–5 fls., ⅕ in. long, in panicles longer than lvs. New Zeal.

arborescens (*O. nitida*). Shrub to 12 ft.: lvs. ovate, to 3½ in. long, sinuate-toothed, satiny-tomentose beneath: heads of 15–20 fls., ¼ in. long, in large branched corymbs. New Zeal. Var. **angustifolia** has lanceolate or linear-lanceolate lvs. Var. **capillaris** (*O. capillaris*) has lvs. to 1 in. long.

argophylla. Tree to 25 ft.: lvs. ovate to oblong-lanceolate, to 5 in. long, toothed or rarely entire, silvery-silky-pubescent beneath, reticulated above: heads few-fld., in large corymbs. Australia.

avicenniæfolia. Tree to 20 ft.: lvs. oval-lanceolate, to 4 in. long, entire, white- or buff-tomentose beneath: heads of 2 or 3 fls., ⅕ in. long, in long-stalked branched corymbs. New Zeal.

capillaris: *O. arborescens* var.

Cunninghamii. Shrub or tree to 25 ft.: lvs. ovate to linear-oblong, to 6 in. long, coarsely toothed, white-tomentose beneath: heads of 12–24 fls., ⅓ in. across, in large branching panicles. New Zeal. Var. **colorata** has narrower lvs.

erubescens: *O. myrsinoides* var.

Forsteri: *O. paniculata.*

fragrantissima. Shrub to 15 ft., with dark brown or black bark: lvs. elliptic-lanceolate to -ovate, to 1½ in. long, entire, silky-tomentose beneath: heads of 4–8 yellowish fragrant fls., ⅕ in. long, in sessile clusters. New Zeal.

furfuracea. Shrub or tree to 20 ft.: lvs. oblong to ovate, to 4 in. long, entire or slightly toothed, silvery-tomentose beneath: heads of 5–12 fls., ⅓ in. long, in branched corymbs. New Zeal.

Gunniana: *O. stellulata.*

Haastii. Shrub to 8 ft.: lvs. oblong, to 1¼ in. long, entire, shining above, white-tomentose beneath: heads of 8–10 fls., ⅓ in. long, in long-stalked corymbs. New Zeal.

ilicifolia. Shrub or tree to 20 ft., with musky odor: lvs. linear to lanceolate, to 4 in. long, spiny-toothed and undulate, yellowish-tomentose beneath: heads of 8–12 florets, ⅓ in. long, in large corymbs. New Zeal.

lineata. Shrub with branches often drooping: lvs. clustered, narrow-linear, to 2 in. long, margins revolute, white-tomentose beneath: heads of numerous fls., in clusters. New Zeal.

macrodonta. Resembling *O. ilicifolia* but with ovate or oblong lvs. toothed but not spiny. New Zeal.

moschata. Shrub to 12 ft., with musky odor: lvs. obovate-oblong, to ¾ in. long, entire, white-tomentose beneath: heads of 12–20 florets, ¼ in. long, in small long-stalked corymbs. New Zeal.

myrsinoides. Low shrub: lvs. obovate or oblong, to ½ in. long, finely toothed, shining and reticulated above, tomentose beneath: heads of 4–8 fls., in leafy panicles. Australia. Var. **erubescens** (*O. erubescens*) has lvs. to 2 in. long and larger heads.

nitida: *O. arborescens.*

nummularifolia. Shrub to 10 ft.: lvs. orbicular to obovate, to ½ in. long, margins recurved, very thick, shining and reticulated above, tomentose beneath: heads of 6–12 fls., ½ in. long, solitary. New Zeal.

odorata. Shrub to 12 ft.: lvs. opposite or clustered, linear-obovate, to 1 in. long, entire, white-tomentose beneath: heads of 20–35 fls., in clusters. New Zeal.

oleifolia. Shrub to 8 ft.: lvs. lanceolate or oblong-lanceolate, to 3 in. long, entire, reticulated above, white-tomentose beneath: heads of 4–8 fls., ⅓ in. long, in loose corymbs. New Zeal.

pachyphylla. Shrub to 8 ft.: lvs. ovate or oblong-ovate, to 5 in. long, entire or undulate, very thick, silvery-tomentose beneath: heads of 7–10 fls., ¾ in. long, in corymbs to 5 in. across. New Zeal.

paniculata (*O. Forsteri*). Shrub or tree to 20 ft.: lvs. oblong or ovate, to 3 in. long, undulate, white-tomentose beneath: heads of 1 fl., ⅕ in. long, in branched corymbs. New Zeal. Var. **elliptica** has narrower lvs.

pannosa. Shrub: lvs. ovate-cordate to oblong, to 3 in. long, entire, reticulated above, densely tomentose beneath: fls. to 1 in. long, in solitary heads. Australia.

parvifolia: *O. virgata.*

Solandri. Shrub to 15 ft.: lvs. opposite or clustered, linear-obovate, to ½ in. long, margins recurved, yellowish-tomentose beneath: heads of 8–20 florets, ⅓ in. long, solitary. New Zeal.

stellulata (*O. Gunniana*). Shrub to 5 ft.: lvs. oblong or lanceolate, to 3 in. long, sinuate-toothed, white-tomentose beneath: heads of 20 or more fls., in leafy panicles. Australia.

suavis. Shrub or tree to 18 ft.: lvs. linear-oblong to ovate, to 1½ in. long, entire, yellowish-tomentose beneath: heads of 6–10 fls., ⅕ in. long, in branched panicles. New Zeal.

Thomsoni. Tree to 15 ft.: lvs. oblong-obovate, to 6 in. long, entire, reticulated above, silvery-tomentose beneath: heads ⅓ in. long, in large corymbs. New Zeal.

Traversii. Tree to 30 ft.: lvs. opposite, oblong or ovate, to 2½ in. long, entire, white-tomentose beneath: heads of 5–15 disk-fls., ¼ in. long, in branching panicles. New Zeal.

virgata (*O. parvifolia*). Shrub to 10 ft.: lvs. opposite or clustered, linear-obovate, to ½ in. long, white-tomentose beneath: heads of 5–12 fls., ¼ in. long, solitary or clustered. New Zeal.

OLEASTER: *Elæagnus angustifolia.*

OLIVE. The developed fruit of *Olea europæa*, grown extensively in Mediterranean countries, and in North America well adapted to parts of California, Arizona, and often grown for ornament and interest in other southern regions. It is somewhat more tender, or requires more sum total of heat, than the wine grape (*Vitis vinifera*). The olive attains great size with age, and eventually the trees should stand 40 feet or more apart each way, but plantations are commonly set at 25 to 30 feet, often with the idea of thinning out the trees in time. The crop demands a deep fertile soil but well drained, and a clear fogless atmosphere is desired for the best results. It thrives well under intelligent irrigation, the requirements being 30 to 40 acre-inches a year, including rainfall.

Propagation of the olive is readily accomplished by means of dormant cuttings 4 or 5 inches long, only the leaves on the tip being retained and those usually cut back somewhat. The cuttings are started in sand under artificial heat and then removed to the nursery. Much larger and heavier cuttings of old wood are sometimes employed, the lower part being variously cut or wounded to stimulate root and stem production. The suckers about the base of the tree, taken with a heel from the trunk, are also employed. Seeds are also used in propagation, but the seedlings must be grafted to the desired variety. To hasten germination the stones are often treated for a day or less to a solution of caustic soda, care being taken that the lye does not penetrate to the kernel; the seeds are then stratified until spring, when they are sown. Some propagators cut off the end of the stone or pit to hasten germination. When one year in the nursery the seedlings may be whip-grafted or side-grafted.

For best results the olive orchard should be given clean tillage. On neglected trees without good moisture supply, the fruit is small or it may not set freely. Attention is given to pruning, and insects and diseases must be promptly met.

For making the ordinary pickled olive, the fruits are gathered when they have reached practically full size but while still good green in color. Ripe pickles rich in eupeptic oil and high in food value are also in demand, and the fruit is taken from the tree when it is black. In any case the fruit is picked by hand to avoid bruising; this is true even when the crop is designed for oil, to prevent rot and mold. The fruit is mechanically graded for pickles, producing different lines or quotations of the product. It is then cleaned, the bitterness removed by lye, and the pickling process completed by hardening and preserving in salt. It requires about 6 pounds of olives to make 1 gallon of pickles, and about 1 ton to yield 35 gallons of oil. The average production of fruit is perhaps 1½ tons to the acre, but greater yields are obtained on the best plantations.

OLIVE, FALSE: *Elæodendron orientale.* **Russian:** *Elæagnus angustifolia.* **Spurge-:** *Cneorum tricoccon.* **-Wood Bark, Bermuda:** *Elæodendron Laneanum.*

OLIVERANTHUS. *Crassulaceæ.* One Mexican much branched per. herb, hardy out-of-doors as far north as Washington, D. C. **O. elegans** (*Cotyledon elegans*). To 20 in.: lvs. near ends of branches, obovate: fls. bright red tipped with yellow, 1 in. long, solitary or twin at ends of branches, in summer.

OLNEYA. *Leguminosæ.* One spiny tree to 25 ft., native in the deserts of Ariz. to Lower Calif. **O. Tesota.** Desert Ironwood. Lvs. pinnate, the lfts. to ¾ in. long, grayish: fls. papilionaceous, violet-purple, in racemes about 1 in. long: pods oblong, to 3 in. or more long, slightly constricted between seeds.—The seeds or beans have been utilized as food by the Indians.

OMPHALODES. Navelwort. Navelseed. *Boraginaceæ.* Low ann. and per. herbs much like Myosotis but differing in technical characters, mostly in Eu. and Asia, with alternate simple lvs. and white or blue fls. in loose racemes resembling forget-me-nots.

A few species are grown in the flower-garden. They succeed in moist partially shady or sunny situations. Propagated by seeds sown in spring or by division.

cappadocica (*O. cornifolia*). Per. to 10 in.: lvs. ovate, heart-shaped at base: fls. rich blue with white in center, ⅓ in. across, in spring. Asia Minor.

cornifolia: *O. cappadocica.*

linifolia (*Cynoglossum linifolium*). Ann. to 1 ft.: lvs. spatulate to linear-lanceolate: fls. white, to ½ in. across, in summer and autumn. Spain, Portugal. Var. **cærulescens** has bluish fls. sometimes tinged rose.

Luciliæ. Per. to 8 in.: lvs. ovate or oblong: fls. rose turning to blue, ½ in. across, in spring. Greece, Asia Minor.

lusitanica (*O. nitida*). Per. to 2 ft.: lvs. oblong-lanceolate, shining above: fls. blue with white center, ⅓ in. across, in spring. Portugal.

nitida: *O. lusitanica.*

verna. Creeping Forget-Me-Not. Per. to 8 in., bearing stolons: lvs. ovate to ovate-lanceolate: fls. blue, ½ in. across, in spring. Eu. Var. **alba** has white fls.

ONAGRA: *Œnothera.*

ONAGRACEÆ (*Œnotheraceæ*). Evening-Primrose Family. Herbs or only rarely shrubs, of various habit, terrestrial or aquatic, ann., bien., per., yielding ornamental subjects in several genera. The ovary, mostly elongated, is inferior and prominent, crowned with the calyx and polypetalous corolla, and commonly with projecting or conspicuous essential organs. The species are several hundred in many parts of the world, in about 40 genera. Most of them are of easy cult. The genera treated in this book are Boisduvalia, Circæa, Clarkia, Epilobium, Eucharidium, Fuchsia, Gaura, Godetia, Jussiæa, Lopezia, Ludwigia, Œnothera, Trapa (sometimes referred to Trapaceæ or Hydrocaryaceæ), Zauschneria.

ONCIDIODA. *Orchidaceæ.* A group comprising a few hybrids between the genera Oncidium and Cochlioda.

Charlesworthi (*O. incurvum* × *C. Noezliana*).

ONCIDIUM. *Orchidaceæ.* Trop. American epiphytic orchids with 1–2-lvd. pseudobulbs and fls. usually in lateral racemes or panicles, the sepals and petals nearly equal, the lip 3-lobed and crested or tubercled at base. They are plants both of cool mts. and hot regions, of various requirements in cult. from coolhouse to warmhouse depending on the species. They usually require considerable sun and air. See *Orchids* for cult.

altissimum. Pseudobulbs with 2 lvs. to 1 ft. long: fls. in nodding racemes to 5 ft. long; sepals and petals yellow spotted with brown; lip yellow with brown center, Apr.–July. W. Indies.

ampliatum. Pseudobulbs with 1 lf. to 8 in. long and 2 in. wide: fls. golden-yellow with red-brown center, in many-fld. panicles to 3 ft. long, Mar.–Apr. Costa Rica, Guatemala. Var. **majus** has larger panicles of fls.

anthocrene. Pseudobulbs with 2 lvs. to 1 ft. long and 2 in. wide: fls. yellow edged and banded with brown, in many-fld. panicles to 4 ft. high, July–Sept. Colombia.

aurosum: *O. excavatum.*

barbatum. Pseudobulbs with 1 lf. to 4 in. long: fls. yellow spotted with brown and red, the lip cut, in 6–12-fld. racemes to 14 in. high, Mar.–May. Brazil.

caloglossum. Considered to be a natural hybrid between *O. Forbesii* and *O. Marshallianum.*

Cavendishianum. Pseudobulbs practically none, with 1 lf. to 1 ft. long: fls. yellow, the sepals thickly spotted with brown, in many-fld. panicles to 4 ft. high, Jan.–Mar. Mex.

Cebolleta. Pseudobulbs very small, with 1 cylindrical lf. to 1 ft. long: fls. yellow, the sepals and petals spotted with red-brown, in many-fld. panicles about 2 ft. high, Feb.–May. Cent. Amer., W. Indies, Brazil.

concolor (*O. unguiculatum*). Pseudobulbs with 2 lvs. to 6 in. long: fls. citron-yellow, in 6–12-fld. drooping racemes to 1 ft. long, Apr.–May. Brazil.

cornigerum. Pseudobulbs with 1 lf. to 5 in. long: fls. dark yellow spotted with red, about ¾ in. across, in many-fld. panicles to 20 in. long, Aug.–Sept. Brazil.

crispum. Pseudobulbs with 2 lvs. to 8 in. long: fls. brown with a large yellow spot in center of each segm., to 3 in. across, very wavy, in many-fld. panicles to 1½ ft. high, Sept.–Dec. Brazil.

curtum. Pseudobulbs with 2 lvs. to 8 in. long: fls. yellow barred and edged with red-brown, 1½ in. across, in much branched panicles, July–Aug. Brazil.

divaricatum. Pseudobulbs with 1 lf. to 1 ft. long: fls. brown tipped with yellow, about 1 in. across, in much branched panicles to 4 ft. high, Sept.–Oct. Brazil.

excavatum (*O. aurosum*). Pseudobulbs with 1–2 lvs. to 1½ ft. long: fls. yellow spotted with brown, 1½ in. across, in many-fld. panicles to 3 ft. long, Apr.–June. Peru, Ecuador.

flexuosum. Pseudobulbs with 1–2 lvs. to 7 in. long: fls. yellow spotted with brown at base, about 1 in. across, in many-fld. panicles to 2½ ft. high, Sept.–Dec. Brazil.

Forbesii. Pseudobulbs with 2 lvs. to 9 in. long: fls. chestnut-brown edged with yellow, 2 in. across, in panicles to 1 ft. high, Sept.–Nov. Brazil.

fuscatum: *Miltonia Warscewiczii.*

Gardneri. Pseudobulbs with 2 lvs. about 8 in. long: fls. yellow edged or spotted with brown, 2 in. across, in many-fld. panicles to 3 ft. high, June–July. Brazil.

Harrisonianum. Pseudobulbs with 1 lf. to 6 in. long: fls. yellow spotted with red, ½ in. across, in 15–20-fld. panicles to 1 ft. high, Oct.–Nov. Brazil.

hastatum. Pseudobulbs with 1 lf. to 9 in. long: fls. 1½ in. across, in panicles to 5 ft. long; sepals and petals chocolate-brown marked with yellow; lip with white or yellow side lobes and red midlobe tipped with green. Mex.

incurvum. Pseudobulbs with 2–3 lvs. to 16 in. long: fls. white spotted with violet-rose, 1½ in. across, in many-fld. panicles to 2 ft. high, Sept.–Nov. Mex.

Jonesianum. Pseudobulbs with 1 lf. to 8 in. long and ½ in. wide: fls. 2 in. across, in 5–9-fld. panicles to 2 ft. long; sepals and petals green spotted with red; lip white with yellow base spotted with red, Aug.–Oct. Paraguay.

Kramerianum. Pseudobulbs with 1 lf. to 8 in. long: fls. golden-yellow spotted with chocolate-brown, the lip wavy, Aug.–Nov. Ecuador, Colombia.

Lanceanum. Pseudobulbs wanting: lvs. to 1½ ft. long and 5 in. wide, spotted with violet: fls. to 3 in. across, in 6–20-fld. panicles to 20 in. high; sepals and petals green thickly spotted with red-brown; lip rose, purple at base, June–July. Guiana.

leucochilum. Pseudobulbs with 2 lvs. to 1 ft. long: fls. in many-fld. panicles to 6 ft. high; sepals and petals green thickly spotted with brown; lip white veined with rose at base, Jan.–May. Guatemala, Mex.

macranthum. Pseudobulbs with 2 lvs. to 1½ ft. long: fls. to 3 in. across, in climbing panicles to 9 ft. long; sepals olive- or brown-yellow; petals golden-yellow; lip yellow with violet base and white crest, May–July. Ecuador, Peru.

Marshallianum. Pseudobulbs with 2 lvs. to 1 ft. long: fls. 2½ in. across, in panicles to 5 ft. high; sepals greenish-yellow spotted with brown; petals golden-yellow, wavy; lip yellow spotted with red at base, Apr.–June. Brazil.

microchilum. Pseudobulbs with 1 lf. to 1 ft. long: fls. about 1 in. across, in many-fld. panicles; sepals brownish edged with yellow; petals violet-brown; lip white with yellow base and spotted with red at tips, June–July. Guatemala.

oblongatum. Pseudobulbs with lvs. about 1 ft. long: fls. yellow, the wavy petals barred with red-brown at base, in winter. Mex.

ornithorhynchum. Pseudobulbs with 2 lvs. to 10 in. long: fls. fragrant, rose or rarely white with golden crests, about 1 in. across, in many-fld. drooping panicles to 1 ft. long, Oct.–Nov. Mex., Guatemala. Var. **albiflorum** (var. *album*) has whitish fls.

Papilio. Butterfly Orchid. Pseudobulbs with 1 lf. to 8 in. long and 2 in. wide, mottled with red: fls. 2½ in. across, solitary on stalks to 3 ft. high; petals and dorsal sepal linear, brown spotted with yellow; lateral sepals yellow with large brown spots, wavy; lip yellow with brown band near margins, blooming all year. Venezuela.

phymatochilum. Pseudobulbs with 1 lf. to 1 ft. long: fls. in many-fld. panicles to 5 ft. high; sepals and petals greenish-white spotted with red-brown; lip white spotted with rose on the claw and with yellow crest, Apr.–June. Mex.

Pubes. Pseudobulbs with 1–2 lvs. to 6 in. long: fls. 1 in. across, in many-fld. panicles to 2 ft. high; sepals and petals brown banded with yellow, the lateral sepals united; lip yellow spotted with red-brown, June–Aug. Brazil.

pulvinatum. Pseudobulbs with 1 lf. to 1 ft. long: fls. 1 in. across. in panicles to 7 ft. long; sepals and petals brown tipped with yellow; lip light yellow spotted with red, July–Aug. Brazil.

sarcodes. Pseudobulbs with 2 lvs. to 10 in. long: fls. 2 in. across, in many-fld. drooping panicles to 5 ft. long; sepals and petals chestnut-brown edged with yellow, the petals wavy; lip golden-yellow spotted with red-brown in center, Apr.–May. Brazil.

sphacelatum. Pseudobulbs with 2–3 lvs. to 2 ft. long: fls. 1 in. across, in many-fld. panicles to 5 ft. long; sepals and petals yellow spotted with brown; lip golden-yellow with brown claw edged with yellow, Feb.–Apr. Guatemala.

splendidum. Pseudobulbs with 1 lf. to 1 ft. long: fls. yellow spotted with brown, 2 in. across, in 9–20-fld. panicles to 4 ft. high, Apr.–June. Brazil.

tigrinum. Pseudobulbs with 2 lvs. to 1 ft. long: fls. yellow, the sepals and petals thickly spotted with brown, 2 in. across, in many-fld. panicles to 2½ ft. high, Oct.–Dec. Mex.

unguiculatum: *O. concolor.*

uniflorum. Pseudobulbs with 1 lf. to 6 in. long: fls. greenish-yellow, in 1–2-fld. infl. about length of lvs., Nov.–Dec. Brazil.

varicosum. Pseudobulbs with 2 lvs. to 9 in. long: fls. about 1 in. across, in many-fld. panicles to 5 ft. high; sepals and petals greenish-yellow spotted with red-brown; lip golden-yellow, Oct.–Jan. Brazil. Var. Rogersii has fls. to 2 in. across.

Wentworthianum. Pseudobulbs with 2 lvs. to 1 ft. long: fls. yellow spotted with brown, 1 in. across, in many-fld. panicles to 6 ft. high, June–Aug. Guatemala.

ONCOBA. *Flacourtiaceæ.* Trop. polygamous shrubs or small trees with alternate lvs., white, reddish or yellow fls. in clusters or solitary, and fr. a leathery berry; one species is planted in Calif.

Routledgei. Spiny shrub to 20 ft.: lvs. oblong, wavy-toothed: fls. white, 2 in. across, fragrant. Trop. Afr.

ONION (species of *Allium*). Hardy cool-season biennials and perennials, cultivated in the vegetable-garden for the edible bulbs and sometimes for the leaves that are used in seasoning. Others of the genus are grown for the ornamental flowers, for which see *Allium.*

The common onion is *Allium Cepa*, native in western Asia, ordinarily biennial, with fistulose or hollow leaves and a prominent bulb. The Welsh onion is *A. fistulosum*, also Asian, a more leafy plant and with bulb soft and little thicker than the neck. The shallot is *A. ascalonicum*, probably Asian but not identified as an indigen; it differs from the onion in small stature, slender awl-like leaves and small more or less angular bulbs that part into several bulbs cohering by the base; the usual shallot of cultivation, however, is a small cluster onion, a form of *Allium Cepa.*

Another fistulose species is the perennial tufted *A. Schœnoprasum*, chive, native in Europe and Asia. It does not produce distinct bulbs. The leaves are used for seasoning, being cut as needed. It is a durable plant and makes an attractive border; the rose-purple flower-heads are ornamental when allowed to develop. The chive (or cive) is readily raised from seeds and propagates well by division. It is hardy and requires no special care, although it is well to divide and reset the stools when they become weak from over-cutting or crowding.

Flat-leaved alliums grown for eating are leek and garlic, which see in their alphabetic order. The leek has a simple bulb, not much thicker than the crown. Garlic is a much smaller plant with the thin-skinned bulb breaking into several integral parts or cloves. Rocambole is a larger plant than garlic (*Allium Scorodoprasum*), grown the same but little seen in North America.

The common field onion is propagated directly from seeds. Other races of the same species are propagated asexually, as by (*a*) sets, (*b*) multipliers, (*c*) "tops" or "acorns"; these races are grown for small green early bunch onions. (*a*) Sets are small onions, the size of a hazelnut more or less, that were arrested in their development by being grown very thickly (from seed) and ripened off early in the season; when planted the next spring they resume their growth. (*b*) Multipliers or potato onions are a form in which the bulb divides into separable parts; each part is planted the following spring (or autumn far South) as are the sets. (*c*) Top onions are little bulbels that appear in the flower-cluster in the place of blossoms; they are handled the same as sets.

Being hardy, onions are started as early in the spring as the ground is dry and settled and can be made fit. The land should be in good tilth, fine and mellow. In the far South, they may be sown in autumn.

Rows stand 12 to 18 inches apart. Seed is sown thickly, covered ½–1 inch deep, and the seedlings or young plants thinned to 2 inches or more apart, depending on the variety. In the home garden, these young onions may be used on the table. Good tillage must be provided until the onions are nearly grown. Soil should hold moisture well as the plants are not deep-rooted; it should be liberally supplied with available plant-food. Soils that bake and become very dry are not adapted to onion growing. For these reasons, well-drained swamp lands are popular for onion culture, but good crops can be grown in the ordinary garden if the earth is deeply prepared, fertile, well supplied with humus, and in superior tilth. Tillage is usually by means of hand tools. Raw rough stable-manure is not used for onions.

After being pulled or lifted, the mature bulbs are allowed to cure a day or two before placed in storage; sometimes they are cured under cover so that they become dry and free from earth. After curing the tops are cut off, about a half inch above the bulb. For home use, onions are stored in the cellar, much as are potatoes.

There are many varieties, differing in season, size, shape, color, flavor. Danvers, Wethersfield, Southport, are standard kinds or races. The large Bermuda, Spanish, and Italian onions require a long season and are usually mild in flavor. A good crop of field onions is 300–500 bushels to the acre, but greater yields are frequently obtained.

Onions are sometimes transplanted when very young, the seeds having been sown in a seed-bed usually under glass, as in a hotbed. Early onions of uniform size, for table use green and for sale as "bunch onions," may be produced by this method.

The onion is subject to serious diseases and pests. The most recent advice should be available from the experiment stations. Smut is treated by applying formaldehyde solution in the drill at seeding time; mildew is more or less controlled by bordeaux spray and by cleaning up all tops in autumn and burning them so that spores will not winter over. Thrips are kept in check by spraying with tobacco preparation, as Black Leaf 40. The maggot is kept in check by poisoning the little flies before they lay their eggs; this is accomplished by setting low cans of molasses about the field to which sodium arsenite is added.

The Welsh onion or ciboule is grown for its leaves, employed as seasoning; raised from seeds sown in spring, the foliage being ready in autumn or following spring.

ONION, SEA-: *Urginea maritima.*

ONOBRYCHIS. *Leguminosæ.* Per. herbs or spiny shrubs with pinnate lvs., papilionaceous fls. in axillary racemes or spikes, and flattened often spiny or crested pods; the second species is grown for forage and others occasionally for ornament. Seeds should be sown in spring or fall where the plants are to grow. Sainfoin is adapted to dry soil.

Crista-galli. To 1 ft.: lfts. less than ½ in. long: fls. flesh-colored: pods with deeply lobed crest on back, to ¾ in. long. Medit. region.

sativa: *O. viciæfolia.*

viciæfolia (*O. sativa*). Sainfoin or Saintfoin. Holy Clover. Esparcet. To 2 ft.: lfts. 1 in. long: fls. pale pink: pods toothed on back, ¼ in. long. Eu., N. Asia.

ONOCLEA. *Polypodiaceæ.* One coarse and not very attractive fern with rhizomes and two kinds of lvs., native of north temp. regions, sometimes transferred to grounds. See *Ferns.* **O. sensibilis.** Sensitive-Fern. Sterile lvs. to 4½ ft. long, deeply pinnatifid, segms. wavy-toothed; fertile lvs. to 2½ ft. long, 2-pinnate, the segms. rolled up into bead-like bodies forming panicles. Newf. west and south to Gulf states, in moist pastures and similar places. For *O. Struthiopteris* and *nodulosa* see *Pteretis.*

ONONIS. Rest-Harrow. *Leguminosæ.* Herbs and shrubs native to Eu., N. Afr. and W. Asia, with lvs. mostly of 3 lfts., papilionaceous fls. solitary or in racemes, and cylindrical or swollen pods; grown in borders and rock-gardens. Of easy cult; propagated by seeds or division.

cenisia. Per. to 10 in., slightly woody at base: lfts. oboval: fls. rose, solitary, in summer. S. Eu.

arvensis: *O. hircina.*

Columnæ. Per. to 10 in.: lfts. oval: fls. yellow, in leafy spikes, May–June. S. Eu.

fruticosa. Shrub to 2 ft.: lfts. oblong-ovate: fls. pink or whitish, 2–3 together, June–Aug. S. Eu., N. Afr.

hircina (*O. arvensis*). Shrubby, to 2 ft.: lfts. oblong-lanceolate: fls. rose and white, usually 2 together, in summer. Eu.

Natrix. Per. to 1½ ft.: lfts. oblong: fls. yellow, solitary, June–July. S. Eu.

repens. Prostrate or ascending: lfts. ovate or obovate: fls. pink, solitary, June–July. S. Eu.

rotundifolia. Shrubby, to 1½ ft.: lfts. round to ovate: fls. bright rose, 2–3 together, in summer. S. Eu.

spinosa. Per. to 2 ft., sometimes thorny: lfts. oblong: fls. pink, 1–2 together, June–July. Eu.

ONOPORDUM. *Compositæ.* Coarse ann. and bien. woolly thistle-like herbs with large alternate prickly-toothed or -lobed lvs. and solitary or clustered heads of purple or white disk-fls., the bracts of involucre often spiny-tipped; pappus of bristles; native of the Old World, a few planted for ornament. Propagated by seed.

Acanthium. Scotch Thistle. Bien. to 9 ft., white-tomentose all over: lvs. oblong, prickly, lobed and toothed, the lower often 1 ft. long: heads to 2 in. across, usually solitary, pale purple, spiny. Eu., Asia; nat. in E. N. Amer. Var. **alba** has white fls.—The plant, or a form of it, is sometimes listed as "Robert Bruce."

alexandrinum: *O. Sibthorpianum* var.

anatolicum: *O. Sibthorpianum.*

arabicum. Bien. with swollen deeply winged sts.: lvs. ovate-lanceolate, sinuate, spiny: heads solitary, purplish-red. Medit. region.

bracteatum. Bien., tall, tomentose: lvs. oblong-lanceolate, shallowly lobed, spiny: heads large, globose, the involucral bracts recurved. E. Medit. region.

illyricum. Bien., sts. with spiny wings: lvs. oblong–lanceolate, pinnate into spiny lobes, white-tomentose: heads purple. S. Eu.

polycephalum. Bien., densely tomentose, tall, sts. grooved: lvs. lanceolate, lobed, spiny: heads in corymbs, rose, spiny. E. Eu.

Sibthorpianum (*O. anatolicum*). Bien. to 3 ft., white-tomentose: lvs. oblong-lanceolate, pinnate into spiny segms., sts. with spiny wings: heads to 3 in. across, purple, spiny. Medit. region. Var. **alexandrinum** (*O. alexandrinum*) is less woolly.

tauricum. To 6 ft.: lvs. elliptic-oblong, lobed, spiny: infl. many-headed. S. Eu.

ONOSMA. *Boraginaceæ.* Hairy ann., bien. and per. herbs of the Medit. region and Himalayas, sometimes undershrubs, with alternate simple lvs. and yellow, purple or white fls. in one-sided racemes; corolla tubular or urn-shaped, stamens commonly included. Sometimes grown in borders and rock-gardens. Propagated by seeds and cuttings in summer.

echioides. Bien. or per. to 1½ ft.: lvs. spatulate or linear-lanceolate: fls. cylindrical, pale yellow or whitish, drooping. S. Eu. to W. Asia.

helveticum: a Swiss form of *O. stellulatum.*

stellulatum. Per. to 8 in.: lvs. linear-oblong: fls. tubular, yellow, 1 in. long. S. Eu. Var. **tauricum** (*O. tauricum*) has revolute lvs. and fls. to 1½ in. long.

tauricum: *O. stellulatum* var.

venustum: listed name.

ONOSMODIUM. False Gromwell. *Boraginaceæ.* Per. hairy herbs of N. Amer. and Mex., with alternate lvs. and white, yellowish or greenish tubular fls. in scorpioid spikes or racemes; may be transplanted but of little ornamental value.

occidentale. To 3½ ft.: lvs. lanceolate or ovate-lanceolate, to 3 in. long: fls. to ¾ in. long, pubescent outside. Ill. to New Mex.

ONYCHIUM. Claw-Fern. *Polypodiaceæ.* Small graceful ferns with 3–4-pinnate lvs. of two kinds and sori borne at tips of segms.; native in Asia, Afr. and trop. Amer. Grown as pot and pan plants in conservatories and similar places. See *Ferns.*

japonicum. Lvs. to 1½ ft. long, thin, light green, 2–4-pinnate into very small segms. Himalayas to Java and Japan.

OPHIOGLOSSACEÆ. Adders-Tongue Family. Five genera of ferns in both hemispheres, of more or less fleshy ferns with simple or compound lvs. from a short rootstock, and yellow spores in sporangia borne in separate fertile spikes or panicles. Some of the species are very small and commonly overlooked when in grass or other herbage. The species of this family are planted sparingly as wild-garden or perhaps rock-garden subjects. Genera herein treated are Botrychium and Ophioglossum.

OPHIOGLOSSUM. ADDERS-TONGUE-FERN. *Ophioglossaceæ.* Small ferns with solitary or few succulent entire lvs. and a contracted long-stalked fertile spike bearing 2 rows of fleshy spore-clusters; of wide distribution, but not often seen by the casual observer and little planted. See *Ferns.*

vulgatum. Hardy: lf. usually solitary, to 16 in. long including the stalk, lf.-blade to 5 in. long and 2 in. wide, sessile; fertile spikes about 2 in. long, on stalks to 10 in. long. Ont. to Fla., Eu., Asia, mostly in moist meadows and thickets.

OPHIOPOGON: *Mondo.*

OPHRYS. *Orchidaceæ.* Terrestrial orchids with basal rosette of lvs. and fls. in terminal racemes, the petals smaller than sepals, lip entire or 3-lobed: for cult. see *Orchids.*

apifera. To 1½ ft.: lvs. oblong or lanceolate: sepals pink or sometimes greenish or white, lip velvety-brown. Eu.—Sometimes planted in rock-gardens or similar places.

OPIUMA: *Pithecellobium dulce.*

OPLISMENUS. *Gramineæ.* Per. grasses weak or decumbent at base, lvs. broad and flat, spikelets in interrupted spikes; native in tropics and subtropics and one planted in greenhouses for hanging-baskets and edgings of beds; propagated by rooting sts. See *Grasses.*

compositus. BASKET-GRASS. Sts. to 3 ft. or more long, somewhat trailing: lvs. to 4 in. long and 1 in. wide; spikes to 4 in. long, awned. Afr., trop. Amer.—Has been cult. under the erroneous name of *O. Burmannii*, also as *O. hirtellus.* Var. vittatus has lvs. striped with white and pink. Sometimes known to florists as *Panicum variegatum.*

OPOPANAX: *Acacia Farnesiana.*

OPULASTER: *Physocarpus.*

OPUNTIA. PRICKLY-PEAR. TUNA. CHOLLA. *Cactaceæ.* Some 250 or more species, although more than three times this number of names are known in the genus, native from Canada to the straits of Magellan. For the most part they are coarse and awkward plants from the cultivator's point of view and do not lend themselves well to pot or tub culture, and relatively few of them are well known to hort. although any number of them may be transferred to grounds. The frs. of some of them, as the tunas and Indian-fig, are edible, and some of the spineless forms are recommended for forage; in times of need, spines are burned off wild plants to provide forage for cattle. Some kinds of opuntia have run wild extensively in Australia, S. Afr. and elsewhere. The opuntias are of various habit, from small tree-like plants or spreading or prostrate, sometimes more or less clambering, areoles mostly carrying spines and also glochids or fine barbed bristles, but some species are naturally spineless or nearly so: fls. commonly 1 at an areole, yellow, red, greenish or white, opening wide: fr. a dry or juicy berry. Two main groups may be recognized by the non-botanist, — the species with flat and mostly broad pads or joints (or at least some of them flat) as the prickly-pears and tunas; those with cylindrical or terete joints or branches as the chollas and tasajos; in the following account the species belonging to the first group are marked 1, and those to the second or cylindric group are indicated as 2. The first group or subgenus (1) is Platyopuntia, the second (2) Cylindropuntia. There is a third subgenus, Tephrocactus, with short usually clustered joints, not much represented in hort. For cult., see *Cacti.*

The odd or even grotesque form of the opuntias and their ability to withstand hardship make them adaptable, as ornamental subjects, to exposed and rocky banks, to rock-gardens and to waste corners where little attention can be given them. A good number of them are hardy practically all over the country. They may be propagated from the joints, and they grow very readily from seeds. The flowers are showy and interesting although of short duration. The spines and glochids, however, restrict their use. *O. Ficus-indica* and *O. Tuna* are grown in tropical and subtropical countries for the abundant edible fruits.

albiflora: *O. Salmiana.*

arborescens: *O. imbricata.*

arenaria. 1: st. prostrate, to 1 ft. long, joints somewhat turgid in growing season but becoming thinner to 3 in. long and half as broad, spines 5–8: fls. red, about 3¾ in. broad. Tex., New Mex.

Auberi: *Nopalea Auberi.*

aurantiaca. 1: low and much branched, joints fragile and linear about 3 in. long, to 1 in. broad, spines 2 or 3: fls. yellow, 1 in. broad. Uruguay, Argentina.

basilaris. 1: in clumps, sts. prostrate or erect, sometimes to 4 ft., joints broad-obovate to 8 in. long, spines mostly none: fls. purple or white, to 3 in. long. S. Utah, Nev., W. Ariz., S. Calif., Mex.

Bergeriana. 1: often making thickets, to 10 ft. and trunk to 16 in. thick, top spreading or clambering, joints narrow-oblong and becoming somewhat glaucous, spines 2 or 3 or 5, unequal: fls. deep red and many, petals 1 in. long. Unknown native; now spread on Riviera and N. Italy.

Bigelovii. 2: usually with an erect trunk to 3 ft. with short branches conspicuous near the top and beset with pale yellow spines, joints 2–6 in. long: fls. magenta to crimson, about 1½ in. long. Characteristic in S. Nev., Ariz., S. Calif., N. Mex.

brasiliensis. 1: to 12 ft., with cylindric naked or spiny trunk and small top, terminal joints flat and leaf-like: fls. yellow, about 2 in. long. S. Brazil to Argentina, Bolivia; nat. in S. Fla.

camanchica: *O. phæacantha.*

catacantha: *O. rubescens.*

Cholla. 2: mostly tree-like, to 10 ft., with trunk to 6 in. diam., in age spineless, joints often in whorls, with large compressed tubercles, spines commonly numerous: fls. deep purple, about 1 in. or more broad. Lower Calif.

cochenillifera: *Nopalea cochenillifera.*

compressa (*O. Opuntia, humifusa, mesacantha, nana, Rafinesquei*). 1: low and spreading or sometimes ascending, joints orbicular to oblong to about 5 in. long, spines 1 or 2 from an areole or wholly wanting: fls. yellow, 2–3 in. across. Ont. and Mass. to Ala. and Mo.; nat. in Eu.—There are several cult forms. This low N. American plant had been improperly known as *O. vulgaris.*

crassa. 1: to 6 ft., somewhat branched, joints ovate to oblong to 5 in. long and glaucous, spines 1 or 2 or wanting, the areoles with brown wool: fls. not described. Unknown wild, probably Mex.

crinifera: *O. orbiculata.*

cylindrica. 2: to 12 ft., more or less branched, joints cylindric and obtuse at apex, spines short and white and sometimes wanting: fls. scarlet, about 1 in. broad. Ecuador, Peru.

decumana: *O. maxima.*

dejecta: *Nopalea dejecta.*

diademata: *O. glomerata.*

Dillenii (*O. horrida*). 1: low and spreading or tall and branching to 10 ft. high, joints obovate or oblong to 16 in. long, spines sometimes few or none but on young areoles often as many as 10 and usually not exceeding 2½ in. long: fls. lemon-yellow but sometimes red, about 3 in. long. Near coast S. C. to S. Amer.—It has been erroneously known as *O. Tuna.*

Drummondii (*O. frustulenta. O. pes-corvi*). 1: prostrate or spreading, 8 in. or less high, joints narrow-linear to broad-oblong to 4½ in. long and half as broad, spines 1, 2 or 4 or wanting: fls. yellow, about 2¼ in. broad. N. C. to Fla. in sand.

echinocarpa. 2: mostly low but sometimes to 4 ft. or more high, much branched, joints short and strongly tubercled, spines many: fls. yellowish, often tipped red outside, ovary densely spiny. Utah, Nev., Ariz., Calif., Lower Calif.

elatior (*O. nigricans*). 1: much branched, to 15 ft., joints obovate to oblong to nearly orbicular to 1 ft. or more long, spines 2–8: fls. dark yellow striped red or sometimes salmon-rose, about 2 in. across. N. S. Amer.

Emoryi: *O. Stanlyi.*

Engelmannii. 1: wide-spreading, joints oblong to orbicular to 1 ft. long, spines mostly 3 or 4 but sometimes only 1 or even wanting or more numerous on old joints: fls. yellow, large. Tex. to Ariz., Mex.

erinacea (*O. ursina*). 1: small low clump with branches ascending or erect, joints ovate to oblong to 4 in. or more long, spines many: fls. red or yellow, about 2½ in. long. Utah, Ariz., Nev., Calif.

Ficus-indica. INDIAN-FIG. 1: large and bush-like or sometimes tree-like and to 15 ft., joints oblong to spatulate to 15 or 20 in. or more long, commonly spineless: fls. yellow, to 4 in. across. Nativity undetermined; widely spread over the world.

floccosa (*O. senilis* of some authors). One of the Tephrocacti with short oblong or globular joints: in clumps or low mounds sometimes 6 ft. diam. with very many erect branches hidden in a mass of long white hairs, spines 1–3 from an areole: fls. yellow, about 1 in. long. Andes, Peru, Bolivia.

fragilis. 1: small and mostly not conspicuous but sometimes making mounds a few in. high, joints fragile from nearly globular to flattened, spines 5–7: fls. pale yellow, about 2 in. across. Wis. to B. C. and south to Tex. and Ariz.

frustulenta: *O. Drummondii*

frutescens: *O. leptocaulis.*

fulvispina: *O. leucotricha.*

glomerata (*O. diademata. O. platyacantha*). One of the Tephrocactus group characterized by branches 1- to few-jointed, the joints short and commonly clustered: in low spreading clumps, branches erect or prostrate, joints globular to more than 2 in. diam., spines thin and papery or wanting: fls. light yellow, small. Argentina.

horrida: *O. Dillenii.*

humifusa: *O. compressa.*

humilis: *O. Tuna.*

imbricata (*O. arborescens*). 2: tree-like, to 10 ft. and more, ultimate joints about 1 in. diam. and strongly tubercled, spines 8–30 and sheathed: fls. purple, 2 in. more or less long. Colo., Tex., New Mex., Mex.

inermis: *O. stricta.*

lanigera: *O. orbiculata.*

leptocaulis (*O. frutescens*). 2: commonly bush-like but sometimes with trunk 3 in. diam. and several ft. high, branches cylindric and slender, spines very slender and mostly solitary at young areoles but 2 or 3 on older ones: fls. greenish or yellowish, about ¾ in. long. S. W. U. S., Mex.

leucotricha (*O. fulvispina*). 1: to 12 or 15 ft., covered with long white bristles, joints oblong to orbicular, pubescent: fls. yellow, about 2 in. long. Mex.

Lindheimeri. 1: commonly erect, to 12 ft., sometimes only spreading, joints orbicular to obovate and somewhat glaucous, spines mostly 1–6: fls. yellow to dark red, to 3½ in. across. La., Tex., Mex.

linguiformis. 1: bushy, 3–4 ft., joints oblong to lanceolate to 20 in. or more, spines yellow: fls. yellow, about 3 in. across. S. Tex.

macrocentra. 1: more or less bushy, to 3 ft., the joints mostly orbicular to oblong and to 8 in. long, commonly with 1 or 2 spines at upper areoles but sometimes spineless: fls. yellow drying red, 3 in. across. W. Tex. to Ariz., Mex.

macrorhiza. 1: commonly nearly prostrate and making a clump, joints orbicular to obovate to 6 in. long, spines 1–4 and to 1 in. long or wanting: fls. yellow with reddish center, about 3 in. across. Mo. and Kans. to Tex.—Has tuber-like roots.

maxima (*O. decumana*). 1: plants large and much branched, joints long-spatulate to 1 ft. or more, spines 1 or 2 and white or wanting: fls. orange-red, 3 in. across. Known only in cult.

megacantha. 1: to 15 ft. or more, often with trunk, joints obovate to oblong to 2 ft. or more long, spines 1–5 and white: fls. yellow to orange, about 3 in. across. Mex.; escaped in some regions.

mesacantha: *O. compressa.*

microdasys. 1: creeping to nearly erect, to 2 ft., joints oblong to orbicular to 6 in. long, spineless: fls. yellow or tinged red, to 2 in. long. N. Mex.

missouriensis: *O. polyacantha.*

multiflora: *O. Tuna.*

nana: *O. compressa.*

nigricans: *O. elatior.*

Opuntia: *O. compressa.*

orbiculata (*O. crinifera. O. lanigera. O. senilis* of some authors). 1: to 3 ft. or so, often broader than high, joints orbicular to obovate or spatulate to 6 in. long, spines several and yellow: fls. yellow. N. Mex.

pes-corvi: *O. Drummondii.*

phæacantha (*O. camanchica*). 1: commonly prostrate, some of the branches ascending, joints mostly longer than broad 4–6 in. long, spines 1–4: fls. yellow, 2 in. across. Tex. to Ariz., N. Mex.

platyacantha: *O. glomerata.*

polyacantha (*O. missouriensis*). 1: low and spreading and commonly making small clumps, joints orbicular and usually less than 4 in. across, spines 9 or fewer: fls. lemon-yellow, tinged red outside, to 2 in. long. N. D. to Alta., Wash., Tex. and Ariz.

polyantha: *O. Tuna.*

Rafinesquei: *O. compressa*; see *O. tortispina.*

robusta. 1: often erect to 15 ft., mostly much branched, joints orbicular to oblong to 10 in. long and glaucous, spines in the wild 8–12: fls. yellow, 2 in. across. Cent. Mex.

rubescens (*O. catacantha*). 1: tree-like to about 30 ft., trunk sometimes 6 in. diam., joints oblong to oblong-obovate to 10 in. long, spines several to many or sometimes wanting: fls. yellow, orange or red, about ¾ in. across. W. Indies.

Salmiana (*O. albiflora*). 2: bushy, to 6 ft., branches terete and to about ½ in. diam. and not tubercled, spines usually several but sometimes wanting: fls. pale yellow to white, 1 in. more or less across. S. Brazil to Argentina.

Scheeri. 1: to about 3 ft., lower branches sprawling, joints oblong to orbicular to 1 ft. longest way, spines 10–12 and yellow: fls. pale yellow becoming salmon, large. Mex.

senilis: *O. floccosa, O. orbiculata.*

spathulata: *Pereskiopsis spathulata.*

spinulifera. 1: tall and much branched, joints orbicular or oblong or obovate to 1 ft. long, with white bristle-like spines or none: fls. purple. Mex.

Stanlyi (*O. Emoryi*). 2: sts. commonly less than 1 ft. high and creeping, much branched and making broad masses, joints 4–6 in. long and strongly tubercled, spines many and stout: fls. yellow, about 2 in. across. New Mex., Ariz., Mex.

stricta (*O. inermis*). 1: bushy and spreading and making large clumps 2½ ft. high, joints obovate to oblong and 3–6 in. long, spineless or sometimes 1 or 2 or more spines to a joint: fls. yellow, about 2½ in. long. Cuba, Fla. to S. Tex.

subulata (*Pereskia* and *Pereskiopsis subulata*). 2: to 12 ft., sometimes with a single trunk to 4 in. diam., branches many and clustered, tubercles large and depressed, spines usually few and yellow but sometimes none: fls. orange or greenish-yellow, reddish outside. Probably Argentina.

tomentosa. 1: to 20 ft. with smooth trunk to 1 ft. diam., joints oblong to narrow-obovate to 8 in. long and soft-pubescent, spines none or very few: fls. orange, about 2 in. long. Cent. Mex.; escaped elsewhere.

tortispina. 1: prostrate and creeping with ascending orbicular to obovate joints 6–8 in. long, spines about 6–8 and white, yellow or brown: fls. sulfur-yellow, to about 3 in. across. Wis. and S. D. to Tex. and New Mex.—Some of the plants known as *O. Rafinesquei* may belong here, but the spines in *O. tortispina* are 2 or more to each areole rather than 1 or 2 or none.

triacantha. 1: semi-procumbent or clambering or even erect but low, joints thick and oblong, to 3 in. long, spines mostly 3: fls. brownish-yellow to cream-color, 2 in. long. W. Indies.

Tuna (*O. humilis. O. multiflora. O. polyantha*). TUNA. 1: to 3 ft. or less, joints to 6 in. long but mostly smaller, obovate to oblong, spines 2–6, light yellow and slightly spreading: fls. yellow and slightly tinged red, about 2 in. across: fr. red, 1 in. or more long. Jamaica.—See also *O. Dillenii.* Tuna is the Mexican name for opuntias.

ursina: *O. erinacea.*

vulgaris. 1: to 20 ft., often with cylindric trunk 6 in. diam., joints ovate to oblong to 1 ft., long, spines 1 or 2 or sometimes 10 or more on the trunk: fls. yellow or reddish, about 3 in. broad. Brazil, Paraguay, Uruguay, Argentina. Var. **variegata** is listed.—See *O. compressa.*

ORACH: *Atriplex hortensis.*

ORANGE: *Citrus*; see *Citrus Fruits* (page 155). **African Cherry-:** *Citropsis.* **Mexican-:** *Choisya ternata.* **Mock-:** *Philadelphus, Prunus caroliniana.* **Natal-:** *Strychnos spinosa.* **Osage-:** *Maclura pomifera.* **-Root:** *Hydrastis canadensis.* **Trifoliate-:** *Poncirus trifoliata.* **Wild-:** *Prunus caroliniana.*

ORCHID: see *Orchids.* **Butterfly:** *Epidendrum venosum, Oncidium Papilio.* **Grass-Pink:** *Calopogon pulchellus.* **Swan:** *Cycnoches.* **-Tree:** *Bauhinia variegata.* **Windmill:** *Bulbophyllum refractum.*

ORCHIDS, ORCHIDACEÆ. ORCHID FAMILY. An extensive family of terrestrial and epiphytic monocotyledonous herbs of more than 500 widely distributed genera, of various habit but mostly with bulbous or thickened roots and the sts. often with thickened internodes or pseudobulbs: the group is characterized by the very irregular fls. having 3 sepals, 3 petals of which the 2 lateral ones are alike and the third modified into a lip which is often spurred and saccate, the stamens and pistil united to form a column or gynandrium on which the pollen is borne in masses or pollinia, inferior ovary, and capsular frs. containing many minute seeds.

Many genera are grown by florists for cut-flowers, by fanciers, and some of the terrestrial kinds in gardens; there are many artificial hybrids in the greenhouse kinds, often between genera. Any number of genera are to be found in the special collections of fanciers, but those most generally cultivated or known within the scope of this book are Acampe, Acineta, Ada, Aërangis, Aërides, Amesia, Angræcum, Anguloa, Anota, Ansellia, Aplectrum, Arachnis, Arethusa, Arpophyllum, Ascocentrum, Ascotainia, Bifrenaria, Bletilla, Brassavola, Brassia, Brassocattleya, Brassocattlælia, Brassolælia, Broughtonia, Bulbophyllum, Calanthe, Calopogon, Calypso, Camarotis, Catasetum, Cattleya, Chysis, Cœlia, Cœlogyne, Cordula, Cycnoches, Cymbidium, Cypripedium, Cyrtopodium, Dendrobium, Dendrochilum, Diacrium, Dinema, Disa, Doritis, Dossinia, Encyclia, Epidendrum, Epipactis, Epiphronitis, Eria, Eriopsis, Esmeralda, Euanthe, Galeandra, Gastrochilus, Gomesa, Gongora, Grammatophyllum, Habenaria, Hæmaria, Hartwegia, Houlletia, Huntleya, Lælia, Læliocattleya, Leptotes, Liparis, Listera, Lockhartia, Lycaste, Macradenia, Masdevallia, Maxillaria, Microstylis, Miltonia, Mystacidium, Neobenthamia, Octomeria, Odontioda, Odontoglossum, Odontonia, Oncidioda, Oncidium, Ophrys, Orchis, Ornithidium, Ornithochilus, Paphiopedilum, Peristeria, Pescatoria, Phaius, Phalænopsis, Pholidota, Physosiphon, Pleione, Pleurothallis, Pogonia, Polystachya, Promenæa, Renanthera, Rhynchostylis, Rodriguezia, Sarcanthus, Sarcochilus, Sarcoglottis, Schomburgkia, Scuticaria, Selenipedium, Sigmatostalix, Sobralia, Sophrocatlælia, Sophronitis, Spathoglottis, Spiranthes, Stanhopea, Stenoglottis, Thrixspermum, Thunia, Trichopilia, Vanda, Vandopsis, Vanilla, Warscewiczella, Xylobium, Zygopetalum. The literature of orchids is extensive and the intending grower should be in touch with it.

The native terrestrial orchids of the northern states and Canada are many. They inhabit cool bogs and some of them are represented on sandy plains and in moist grasslands. Many of them are unshowy, as in the genera Aplectrum, Epipactis, Habenaria, Liparis, Listera, Microstylis, Spiranthes; others have showy or very prominent flowers, as in Arethusa, Calopogon, Calypso, Cypripedium, Pogonia. Any of these orchids may be transferred to grounds and some of them are offered by dealers in native plants. The conditions under which they grow naturally are diverse; one must know these conditions and endeavor to reproduce them in order to make a success of the cultivation. The little native orchids add a particularly interesting touch to rock-gardens, bogs, and to wild places under control of the gardener.

The commercial orchids of house culture are from regions within the tropics, although many of them come from high elevations. Most of them are forest or shade-loving plants. These orchids are principally in the genera Brassavola, Calanthe, Cattleya, Cœlogyne, Cordula, Cymbidium, Dendrobium, Lælia, Lycaste, Miltonia, Odontoglossum, Oncidium, Paphiopedilum, Phalænopsis, Vanda. One undertaking the culture of these and other exotic orchids should know whether they are epiphytes, and the approximate elevations and conditions as to moisture, shade and sunlight under which they grow in nature. The culture of the main orchid groups is now so well learned that many of the species are grown for the cut-flower trade.

The culture of orchids requires close observation and adaptability on the part of the grower, and he should not start out independently until he has had good experience under a competent man. The niceties of orchid-growing are the result of much devotion to the subject. A difference of two or three degrees in temperature, or a slight variation in watering or shading, may make the distinction between success and failure. The resting period of the different kinds must be carefully understood and adjusted. Nearness to the glass or remoteness from it are important. If one is growing the usual run of common and commercial orchids, one kind of greenhouse may be sufficient, but if a wide assortment of fancier's species is to be grown there should be houses of different temperature and moisture conditions. For the warmest species, the winter temperature should not go below 65° to 70° at night; in such conditions one may raise the more tropical cypripediums (Cordula, Paphiopedilum), angræcums, aërides, calanthes, dendrobiums, phalænopsis. A cooler range, with minimum night winter temperature of 60–65°, should grow the more tropical epidendrums and lælias, the cattleyas, some of the miltonias, stanhopeas. A range running a few degrees lower may be employed for the cooler or Mexican lælias, many maxillarias, lycastes, oncidiums, some of the cœlogynes (as *C. cristata*), phaius. The odontoglossums usually require special treatment to reduce the sun's heat in summer; they are plants of high altitudes; houses should be moist, well ventilated, and in hot weather the roof may be sprayed outside with cold water; sometimes thin shading is employed for this purpose.

The two cultural groups of exotic orchids are the terrestrials and the epiphytes, although these divisions are not absolute; some growers make one cultural group to comprise the deciduous kinds and another the evergreen. As classes, the terrestrials and epiphytes do not differ in temperature and moisture requirements but the terrestrial kinds are grown in pots of soil and the true epiphytic kinds mostly on blocks or in baskets or cribs. In general, terrestrial orchids thrive in a soil comprised of about one-half fibrous loam to which is added approximately equal parts of leaf-mold and sharp sand. Some growers make a mixture of one-third good chopped sod with part of the fine silty soil removed, one-third live chopped sphagnum, one-third leaf-mold; ground bone may be added for vigorous plants. The purpose is to provide a medium containing sufficient plant-food at the same time that it is thoroughly well drained and aerated and yet retains the necessary moisture. The observing grower soon develops mixtures to suit his needs.

The epiphytic orchids require much fibrous or peaty material in which to grow. This material is usually obtained from the roots of wild ferns, particularly of the osmundas, that are chopped and rubbed on a sieve to remove the fine earth. This osmundine or orchid peat is now a standard base for potting mixture as it does not soon decay and it supplies the necessary physical properties. With the osmundine or similar material are combined chopped sod and leaf-mold for the semi-terrestrial orchids, but it may be used alone for the true epiphytes. Live sphagnum is sometimes added to it.

Propagation of orchids has undergone a radical revolution in recent years consequent on the cessation of the importing of fresh roots from the tropics and the closer study of germination requirements. The old methods still are practiced of propagating by separation or offsets as in dendrobium, by division and by cuttings. Just before active growth begins, well established plants of the cypripediums and some others may be divided. Cuttings may be made of the stems of species that do not produce pseudobulbs; on some orchids, as vandas, aerial roots develop along the continuing stem and the cutting may be made below this point; other shoots are likely to arise near the severed area and these may also be employed for cuttings.

A special kind of cutting or division obtains in the pseudobulbous species, as in cattleyas, cœlogynes, odontoglossums and some of the dendrobiums. Behind the active growing shoots are the old pseudobulbs attached to the rhizome; part of this rhizome bearing one to three or more pseudobulbs may be partially severed and allowed to remain until new growth begins on it, or completely severed and potted at once.

Propagation by means of seeds has been a difficult and dubious process, but recent investigation has put the practice on an assured successful basis. The difficulty was due in part to the minute size of the seeds which make them especially susceptible to injury by various micro-organisms and insects. According to certain European investigators the orchid embryo must become infected by that particular fungus which is found in the root of orchid plants, and the fungus method has been put into practical use abroad. The investigations of Knudson in the United States reveal, however, that the fungus plays no direct part in the germinating process and that successful germination of orchid seed depends on a supply of available organic matter which constitutes food for the embryos. On this latter principle Knudson has devised a method that insures successful germination of orchid seeds and is now widely employed under commercial conditions.

The Knudson method of germinating seedlings under aseptic conditions is similar to those employed in culturing bacteria. For this purpose a nutrient solution is made up, consisting of calcium nitrate 1 gram, dibasic potassium phosphate 0.25 gram, magnesium sulfate 0.25 gram, ferric chloride 0.05 grams, ammonium sulfate 0.50 gram, agar 15 grams, cane-sugar 20 grams and distilled water one liter. The salts supply nutrients, the sugar supplies organic food, and the agar is to make the medium gel. The solution is improved by the addition of a minute quantity of acid but this amount cannot be specified without knowing the quality of the other ingredients. This culture medium is heated until the agar dissolves and then poured into culture tubes (Fig. 9). These tubes are then plugged with cotton and sterilized. After sterilization and when still hot the tubes are placed in an inclined position to give a slope to the culture medium. The seeds are then sterilized by use of a solution of chloride of lime and transferred to the tubes by means of a looped platinum wire. The technique used in bacteriology must be followed. After the seeds have germinated they may be transferred to flasks (Fig. 9) containing the same medium but only ¹/₁₀ per cent sugar. There they may be kept for a year or so until large enough to transplant in the open. The seedlings may also be transplanted from the tubes to the open, although greater care must be given the seedlings. From this point, the plantlets are given the same attentive care that is familiar to orchidists who are acquainted with propagation. The transplanting of any orchid seedlings requires great pains.

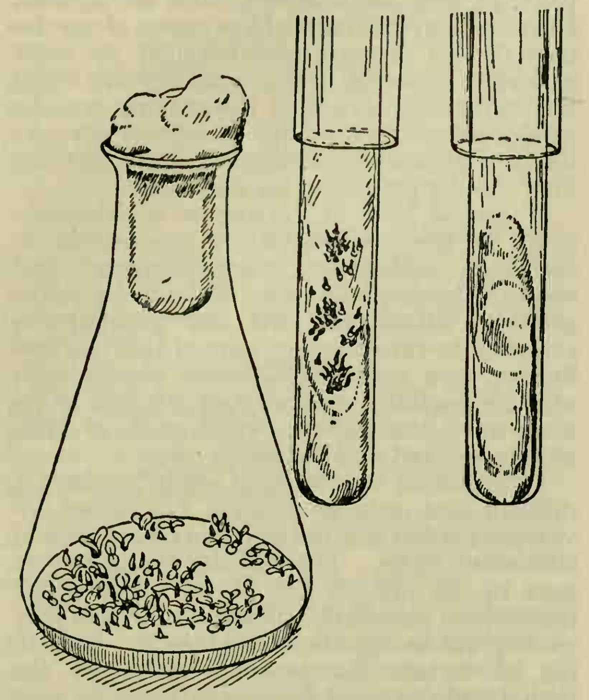


FIG. 9. Seed-propagation of orchids.—Middle tube shows good germination. Right-hand tube shows no germination due to absence of sugar. Flask shows three-months-old seedlings (reduced).

Transplanting of the seedlings takes place when two or three leaves have appeared or when the rootlets become readily visible to the naked eye. This may be anywhere from two to eight months after sowing. They are placed in 2½-inch pots, with drainage and charcoal in the bottom. The pots should be sterile. The soil should be fine peat or similar substance. As many as 100 seedlings may be set in one pot. The pots are placed in a moist warm glass frame or case free from drafts. In six months or so the seedlings may be transplanted again into 2½-inch pots, only 25 being set therein; at the third transplanting only 5 or 10 seedlings occupy a pot. In three to eight months from the first shift the plantlets of most kinds should be ready for separate or individual pots; about two years are usually allowed from the seed sowing to the individual potting; thereafter some four to six years are required to bring the plants into bloom, depending on the species and the general growing conditions.

If seeds are germinated in the Knudson or other nutritive solutions, the plantlets will be larger when removed and first transplanted, and only a few need be placed in a 2½-inch pot and fewer transfers are necessary, but otherwise the treatment is the same.

While the Knudson method is advisable for commercial establishments where loss and failure must be reduced to the minimum and also for the germination of very choice and rare seeds, the amateur and some large growers may nevertheless prefer sowing the seeds on soil or other stratum. The seeds are sown as soon as ripe. Early spring is a preferable time. Sometimes the seeds are dusted on the pots or baskets of the parent plant or of related species and then imbedded in the soil by very careful watering. It may require three months or two years for the seeds to germinate under this method, and in the meantime the soil should not be disturbed. Sometimes the seeds are germinated on burlaps or rough Turkish toweling in a case, and in this way conditions can be better controlled and the plantlets more certainly protected from disease and injury.

Germination by the fungus method consists in inoculating a sterilized peat mixture with a pure culture of the rhizoctonia or root fungus. When the mixture is permeated with the fungus, the seed is sown essentially as in other methods, and the young plants go through a similar course of transplanting.

ORCHIS. *Orchidaceæ.* Terrestrial orchids of woods, swamps and moist places, with tuberous roots, mostly basal lvs. and rather small fls. in terminal racemes or spikes, the sepals similar and either united or spreading, the petals usually smaller, the lip entire or 3-lobed and spurred at base; planted in moist situations in rock-gardens and elsewhere out-of-doors. See *Orchids*, also *Habenaria.*

maculata. To 1 ft. or more: lvs. ovate or lanceolate, often dark spotted: fls. pink, in dense spikes to 3 in. long, the lip spotted with purple, June. Eu., Asia.

rotundifolia. To 6 or 7 in.: lf. single, oblong to nearly orbicular: fls. magenta, lip light and spotted magenta and 3-lobed. Que. to N. Y. and west.

spectabilis (*Galeorchis spectabilis*). SHOWY ORCHIS. To 1 ft.: lvs. 2, to 8 in. long and 4 in. wide: fls. about 1 in. long, in 3–10-fld. spikes; sepals and petals purple, united into a hood; lip white marked with violet, May–June. N. B. to Ga. and Mo.

ORCHYLLIUM: see *Utricularia.*

OREOBATUS: *Rubus deliciosus.*

OREODOXA (as to West Indian species): *Roystonea.*

OREOPANAX. *Araliaceæ.* Shrubs or trees with entire, lobed or digitate lvs. and diœcious or polygamous fls. in heads borne in panicles or racemes, and berry-like fr.; native in trop. Amer. and grown under glass, in the open only in the warm parts of the country. Propagated by cuttings and seeds.

Thibautii: *O. xalapense.*

xalapense (*O. Thibautii*). Shrub or small tree: lvs. of 5–9 oblong or obovate lfts. to 1 ft. long, nearly entire: heads ½ in. across, in racemes 1 ft. long: fr. black. Mex., Cent. Amer.

ORIGANUM. MARJORAM. *Labiatæ.* Per. herbs of the Old World, one cult. for the aromatic foliage and attractive small purple-pinkish fls. borne in spikes.

Origanum is easily grown in all warm garden soils; the plants should stand 10 inches in rows 15 inches apart. Propagated by seed or usually by division in spring or early autumn.

Majorana: *Majorana hortensis.*

Onites: *Majorana Onites.*

vulgare. Hardy per. sweet herb to 2½ ft., rootstocks nearly horizontal: lvs. broad-ovate, 1½ in. long: fls. in clusters to 2 in. across. Eu.; nat. in N. Amer. Var. **aureum** has golden or yellow lvs.

ORIXA. *Rutaceæ.* One deciduous shrub to 10 ft. native in Japan and hardy in S. New England. **O. japonica** (*Celastrus Orixa*). Lvs. alternate, obovate, to 5 in. long: fls. diœcious, small, greenish, the staminate in racemes, pistillate solitary: fr. of 4 carpels.—Propagated by greenwood cuttings, root-cuttings, layers and seeds.

ORMOSIA. NECKLACE-TREE. *Leguminosæ.* Trop. trees with pinnate leathery lvs., papilionaceous fls. usually in terminal panicles, and compressed mostly thick and leathery pods; the ornamental seeds of several species are made into necklaces; sometimes planted in the tropics and subtropics.

dasycarpa: *O. monosperma.*

monosperma (*O. dasycarpa*). Large timber tree: fls. blue, the panicles rusty-tomentose: pods 1½ in. long, rusty-tomentose, with 1 large scarlet seed with a black patch. W. Indies.

ORNITHIDIUM. *Orchidaceæ.* Trop. American epiphytes with 1-lvd. pseudobulbs and solitary rather small fls., the sepals and petals similar, the lip 3-lobed; grown in warm greenhouse. See *Orchids.*

densum (*Maxillaria densa*). Lvs. to 8 in. long: fls. white with reddish lip and yellow throat, on stalks to 1 in. long which are borne in clusters, Jan.–Apr. Mex., Guatemala.

ORNITHOCHILUS. *Orchidaceæ.* Two epiphytic orchids with fls. in pendulous racemes or panicles, the sepals and petals similar, the lip 3-lobed, clawed and spurred at base; see *Orchids* for cult.

fuscus. Lvs. to 5 in. long and 2 in. wide: fls. in many-fld. panicles to 14 in. long; sepals and petals greenish-yellow striped with red; lip yellow with red tip, May–June. Burma to China.

ORNITHOGALUM. *Liliaceæ.* Bulbous herbs with either narrow or rather broad basal lvs. and white, yellow or reddish fls. in bracted racemes or corymbs at top of scape, the perianth-segms. distinct.

The hardy kinds may be planted out-of-doors and left undisturbed. The tender species, from Africa and Mediterranean region, may be grown in pots in the greenhouse or in frames, sometimes in window-gardens. Propagated by offsets.

arabicum. To 2 ft.: lvs. to 2 ft. long and 1 in. broad: fls. white with black pistil, 1 in. long, fragrant, in racemes. Medit. region.—Useful in conservatory.

caudatum. To 3 ft.: lvs. to 2 ft. long and 1½ in. across: fls. white with green center, 1 in. across, in long racemes. S. Afr.—Sometimes seen in windows.

graminifolium. Lvs. to 1 ft. long, cylindrical: fls. white, ⅓ in. long, in racemes to 3 in. long. S. Afr.

narbonense. To 1½ ft.: lvs. to 1½ ft. long and ½ in. wide: fls. white keeled with green on outside, to 2 in. across, in racemes. S. Eu.

nutans. To 2 ft.: lvs. to 1½ ft. long and ½ in. wide: fls. white inside, green with white margins outside, to 2 in. across, nodding, in racemes. Eu., S. W. Asia; run wild in Pa. and elsewhere.

pyramidale. To 2 ft.: lvs. to 1½ ft. long and ½ in. across: fls. white keeled with green outside, 1 in. across, in long narrow racemes. S. Eu.

thyrsoides. To 1½ ft.: lvs. to 1 ft. long and 2 in. wide: fls. white or yellow in vars., ¾ in. long, in dense racemes. S. Afr.

umbellatum. STAR-OF-BETHLEHEM. To 1 ft.: lvs. to 1 ft. long and ⅓ in. broad: fls. white, green margined with white outside, 1 in. across, in umbel-like corymbs. Medit. region; run wild in northern states.

ORNITHOPUS. *Leguminosæ.* Herbs with pinnate lvs., small papilionaceous fls. in axillary heads or umbels, and linear pods separating into 1-seeded joints; one species is grown to some extent as a forage and green-manure crop. Seed should be sown in spring.

sativus. SERRADELLA. Ann. to 1½ ft.: lfts. small and numerous: fls. rose-colored, in few-fld. umbels. Spain, Morocco.

ORNUS EUROPÆA: *Fraxinus Ornus.*

OROBUS: *Lathyrus* and *Vicia.*

ORONTIUM. *Araceæ.* One aquatic herb native in E. N. Amer., sometimes transferred to bogs and pond-margins where it roots deeply. **O. aquaticum.** GOLDEN-CLUB. Lvs. oblong-elliptic, to 1 ft. long and 5 in. wide, floating or ascending, dark green above and paler beneath, on petioles to 20 in. long: spadices 2 in. long, yellow, borne on white scapes to 2 ft. long; spathes soon deciduous.

OROXYLON. *Bignoniaceæ.* One tree to 40 ft., native from India to Malaya, and grown in the open in S. U. S. It prefers rich soil and is propagated by seeds and cuttings over heat. **O. indicum.** Lvs. 2–3-pinnate, the ovate entire lfts. to 5 in. long: fls. white or purplish, bell-shaped with 5 crisped lobes, to 2½ in. long and 3½ in. across, in terminal panicles: fr. linear, to 3 ft. long. For *O. flavum* see *Radermachia pentandra.*

ORPINE: *Telephium.* Family: *Crassulaceæ.*

ORTHOCARPUS. OWLS CLOVER. *Scrophulariaceæ.* Ann. and per. herbs in W. N. and S. Amer., allied to Castilleja, with alternate entire or cut lvs., those in the infl. often colored, and 2-lipped tubular white, yellow or cream-colored fls. in spikes; sometimes grown in the flower-garden.

purpurascens. Ann., 1 ft.: lvs. cut into linear or thread-like segms.: fls. crimson or purple, to 1¼ in. long, the lower lip tipped white and with yellow or purple markings, in dense spikes to 4 in. long, fl.-bracts tipped with red. Calif.

ORTHOSTEMON: *Feijoa.*

ORYZA. *Gramineæ.* Ann. and per. marsh grasses, one widely grown for the grain: lvs.

flat: spikelets large, flattened, in terminal panicles. See *Grasses.*

sativa. Rice. Ann. to 4 ft.: lvs. to 2 ft. long and ½ in. wide: panicles to 1 ft. long, curved or nodding, branches ascending: grains yellow or straw-colored, white when polished (as in the commercial article). E. Indies, but escaped in trop. regions.—Widely cult. in trop. and warm-temp. regions for the grain, requiring water conditions for part of its development.

OSAGE-ORANGE: *Maclura.*

OSCULARIA. *Aizoaceæ.* Separated from Mesembryanthemum (which see for cult.). **O. caulescens** (*M. caulescens*) is a subshrubby per. with erect spreading branches, to 1½ ft.: lvs. triangular, somewhat curved, glaucous, toothed on edges but not on keel, to ¾ in. long: fls. rose, fragrant, to about ¾ in. across. S. Afr.

OSIER: *Salix.*

OSMANTHUS. *Oleaceæ.* Evergreen shrubs or trees with opposite entire or toothed lvs. green and glabrous underneath, bisexual or unisexual fls. in clusters or racemes, and fr. a 1-seeded drupe; grown under glass or in the open in mild or warm regions. Propagated in late summer by cuttings of half-ripe wood under glass: seeds do not germinate until the second year, and are not often obtainable.

americanus. Devil-Wood. To 45 ft.: lvs. elliptic to lanceolate, to 7½ in. long, entire, shining above: fls. greenish, fragrant, corolla-tube about length of lobes. N. C. to Fla. and Miss.

Aquifolium: *O. ilicifolius.*

armatus. To 15 ft.: lvs. oblong-lanceolate or lanceolate, to 5½ in. long, spiny-toothed, reticulate: fls. fragrant, Sept.–Oct. China.

Delavayi. To 6 ft.: lvs. ovate, to 1 in. long, toothed: fls. white, fragrant, the corolla-tube much longer than lobes, Apr. China.

Fortunei. Hybrid between *O. fragrans* and *O. ilicifolius:* to 6 ft.: lvs. ovate, to 4 in. long, spiny-toothed: fls. fragrant.

fragrans (*Olea fragrans*). To 30 ft.: lvs. oval to oblong-lanceolate, to 4 in. long, entire or fine-toothed: fls. white, fragrant, corolla divided nearly to base, early spring. Asia.—An old greenhouse plant.

ilicifolius (*O. Aquifolium. Olea ilicifolius* and *Aquifolium*). To 20 ft.: lvs. oval to oblong, to 2½ in. long, with few large spiny teeth, shining: fls. white, fragrant, corolla divided nearly to base, June–July. Japan. Var. **argenteo-marginatus**, lvs. marked with white. Var. **aureus** (var. *aureo-marginatus*), lvs. variegated with yellow. Var. **myrtifolius**, lvs. smaller, entire. Var. **rotundifolius**, dwarf, lvs. 1 in. long, entire or with short teeth.

OSMARONIA (*Nuttallia*). *Rosaceæ.* A deciduous shrub native from B. C. to Calif. and planted for ornament, hardy in north central states. **O. cerasiformis.** Osoberry. To 15 ft.: lvs. oblong-lanceolate, to 4 in. long, entire: fls. diœcious, greenish-white, fragrant, ⅓ in. across, in drooping racemes in Apr.–May: fr. a bluish-black drupe to ½ in. long.—It does best in shady places in moist soil. Propagated by seeds sown when ripe or stratified, and by suckers.

OSMIA: *Eupatorium odoratum.*

OSMORHIZA (*Washingtonia*). *Umbelliferæ.* Per. herbs with fleshy roots, ternately compound lvs., very small white fls. in few-rayed umbels, and linear frs.; native in N. and S. Amer. and E. Asia.

brevistylis: *O. Claytoni.*

Claytoni (*O. brevistylis*). To 3 ft., hairy: lvs. to 1 ft. across, the segms. ovate, deeply toothed. N. S. to N. C. and Ala.

OSMUNDA. *Osmundaceæ.* Tall rather coarse but attractive deep-rooted ferns with 2-pinnate or -pinnatifid lvs. in large crowns, the fertile segms. much contracted and forming separate panicles, or in *O. Claytoniana* some of the pinnæ only transformed and spore-bearing; native in Asia, N. and S. Amer. See *Ferns.*

cinnamomea. Cinnamon-Fern. Hardy: sterile lvs. to 5 ft. long, on stalks 1 ft. long, rusty-tomentose when young, 2-pinnatifid, margins usually entire; fertile lvs. in the center, 2-pinnate, becoming cinnamon-brown as spores mature. N. Amer., W. Indies, S. Amer., E. Asia.

Claytoniana. Interrupted-Fern. Lvs. to 4 ft. long on stalks to 2 ft. long, 2-pinnatifid, margins usually entire, the spores confined to a few of the central pinnæ. N. Amer., Asia.

regalis. Royal-Fern. Lvs. to 6 ft. long, 2-pinnate, margins finely toothed, the fertile pinnæ forming terminal panicles. N. Amer., trop. Amer., Eu., Afr.

OSMUNDACEÆ. Osmunda Family. Three genera of ferns in both Old and New Worlds, of large ferns with 1–3-pinnate or -pinnatifid lvs. and naked sporangia borne on modified pinnæ or in clusters on lower surface of lvs. Leptopteris and Osmunda are grown in the open.

OSOBERRY: *Osmaronia cerasiformis.*

OSTEOMELES. *Rosaceæ.* Asian and Polynesian shrubs with alternate pinnate lvs., white fls. in terminal corymbs, and fr. a small pome.

Grown for ornament mostly in mild regions (as southern states) where they prefer well-drained soil and a sunny position. Propagated by seeds which germinate slowly, by cuttings under glass, or grafting on cotoneaster.

anthyllidifolia. To 6 ft., evergreen: lfts. 13–19, to ½ in. long, silky-pubescent beneath: fls. ½ in. across: fr. pubescent. Hawaii south.—Stands in parts of N. Y.

Schwerinæ. To 10 ft., deciduous or semi-evergreen: lfts. 15–31, to ⅓ in. long, gray-pubescent beneath: fls. ½ in. across: fr. glabrous. China.

OSTERDAMIA: *Zoysia.*

OSTROWSKIA. *Campanulaceæ.* One per. herb from Cent. Asia, hardy in the N. with winter protection but not very durable. It should have a sunny exposure on well-drained ground. Propagated by cuttings of young growth or roots: also by seeds but these may require years to germinate. **O. magnifica.** Giant Bellflower. To 5 ft. or more: lvs. whorled, ovate, to 6 in. long, toothed: fls. pale lilac, to 4 in. across.

OSTRYA. Hop-Hornbeam. *Betulaceæ.* Deciduous monœcious small trees with alternate toothed lvs., staminate fls. in slender drooping catkins, pistillate in erect catkins, and fr. a nutlet inclosed by a bladder-like light green involucre; native in the northern hemisphere where it may be cult. for ornament. Propagated by seeds sown in fall or stratified.

virginiana. American H. Ironwood. To 60 ft.: lvs. to 5 in. long: fruiting catkins to 2½ in. long, drooping. Ont. to Fla. and Tex.

OTHAKE SPHACELATUM: *Polypteris Hookeriana.*

OTHONNA. *Compositæ.* S. African shrubs or herbs, often with tuberous roots: lvs. basal or st.-lvs. alternate or clustered at ends of branches: heads yellow, solitary or clustered, of ray- and disk-fls.; pappus of bristles.

Othonnas are grown in conservatories or hanging-baskets. They thrive in any soil with good drainage. Propagated by pieces of the stem treated as cuttings, or by portions of the stem that have rooted where they rested on the soil.

capensis: *O. crassifolia.*

carnosa. Subshrub, 9 in. high: lvs. linear-terete, fleshy, to 2 in. long: heads few, in corymbose panicles.

crassifolia (*O. capensis*). Per. with slender or trailing sts., becoming shrubby at base: lvs. scattered or in clusters, fleshy, cylindric-obovoid, to 1 in. long: heads ½ in. across, solitary on sts. to 4 in. long, opening in sun.—Frequent under glass.

OURISIA. *Scrophulariaceæ.* Per. erect, decumbent or prostrate herbs of the Andean region of S. Amer., New Zeal. and Tasmania: lvs. mostly radical, opposite, entire or crenate: fls. mostly white but running into purplish shades and yellow centers, sometimes scarlet, clustered on a scape-like st. or sometimes axillary and solitary; stamens 4. Sometimes grown in rockeries and shady places.

coccinea. To 1 ft.: lvs. oval or oblong, dentate-lobed: fls. scarlet, drooping above the foliage, stamens exserted. Chile; more or less hardy N.

macrocarpa. Sts. stout, to 2 ft., but usually lower: lvs. persistent, oblong or orbicular, to 8 in. long, ciliate: fls. whorled, white with more or less yellow center, to 1 in. diam. New Zeal.; hardy N. in cool woods or rock-garden.

macrophylla. Differs from *O. macrocarpa* in more slender habit, pubescent rather than glabrous, and less leathery lvs. New Zeal.

OUVIRANDRA: *Aponogeton fenestralis.*

OVARY: ovule-bearing part of a pistil, becoming (sometimes with attachments) the fruit.

OVATE: with an outline like that of a hen's egg cut in two lengthwise, the broader end downward.

OVOID: a solid that is oval (less correctly ovate) in flat outline.

OVULE: the body which, after fertilization, becomes the seed; it is contained, perhaps with others, in the ovary.

OXALIDACEÆ. Oxalis or Wood-Sorrel Family. About 10 widely distributed genera of herbs, shrubs and trees, with usually compound lvs., regular fls. with 5 sepals and petals, 10 stamens and superior 5-celled ovary, and fr. a dehiscent caps. or fleshy berry. It is allied to Geraniaceæ. Only the genera Averrhoa, grown for its edible fr. as well as for the ornamental tree, and Oxalis, planted for ornament, are known in cult.

OXALIS. Wood-Sorrel. *Oxalidaceæ.* Herbs, often producing tubers or bulbs, with clover-like digitate lvs. which close at night, white, pink, red or yellow axillary often long-stalked fls. and capsular quickly dehiscent fr.; about 300 widely distributed species, grown for ornament or a few for the edible roots. Some of the species have somewhat branching lf.-bearing sts., sometimes more or less woody, and others are scapose with the peduncles arising directly from the crown of the plant or the bulb.

Propagated by bulbs or division of the roots and by seeds. For bloom in late winter or early spring in window-garden and conservatory, bulbs should be divided in September. After blooming the bulbous kinds should be placed in a cool cellar for a resting period. The flowers are showy in sunshine.

Acetosella. European W. Low early-blooming scapose per.: lfts. 3, obcordate: fls. white with purple or rose-purple veins, the petals oval, obtuse, not emarginate. Eu.—See *O. montana.*

adenophylla. Scapose per., roots tuberous: lfts. 12–22, obcordate, ½ in. long, glaucous: fls. pink with deeper veins, solitary or in few-fld. umbels. Chile.

americana: *O. montana.*

Bowieana (*O. Bowiei. O. purpurea. Caudoxalis Bowieana*). Scapose per. with thickened roots and scaly bulbs: lfts. 3, large, obcordate: fls. rose-purple, to 2 in. across, in summer. S. Afr.

bupleurifolia. Somewhat shrubby: petioles flattened and leaf-like, bearing 3 small deciduous lfts. at tips: fls. yellow, among the lvs. Brazil.

californica (*Xanthoxalis californica*). Tufted per. with prostrate sts. to 8 in. or more long: lfts. 3, oval, to ⅖ in. long: fls. yellow, ⅓ in. across, 1–3 together. S. Calif.

carnosa. Scapose per. with spindle-shaped roots: lfts. somewhat fleshy, obcordate: fls. yellow, in autumn, 2, 3 or several to a scape, the petals emarginate or denticulate. Chile.

cernua (*Bolboxalis cernua*). Buttercup O. Bermuda Buttercup. Scapose per. with thickened roots and deep scaly bulbs: lfts. 3, deeply obcordate: fls. bright yellow, to 1½ in. across, nodding, in spring. S. Afr.; nat. in Bermuda and Fla.

corniculata (*Xanthoxalis corniculata*). Creeping per. but blooming first year: lfts. 3, small, obcordate: fls. light yellow. Eu.; escaped in N. and trop. Amer.—Frequent on the floor of greenhouses. Var. **atropurpurea** (*O. tropæloides*) has purple lvs. and is used for bedding.

crenata. Oka. Per. but grown as ann. from underground tubers, which are eaten in S. Amer.: lfts. 3, obovate: fls. yellow striped with purple, axillary. Peru.

decaphylla. Scapose, from solitary bulb: lvs. digitate, circular in outline, of 8–10 narrow bifid lfts.: fls. violet, small, many in an umbel. Mex.

Deppei (*Ionoxalis Deppei*). Scapose per. with simple scaly bulbs: lfts. mostly 4, truncate, not notched: fls. red, in umbels. Mex.

enneaphylla. Scapose per. with tuberous roots: lfts. 9–20, obcordate, glaucous: fls. white with lavender veins, solitary. Falkland Isls.

floribunda. Fls. rose with darker veins, or white. Botanical position uncertain but probably a form of *O. rosea* or *O. lasiandra.*

heterophylla. Bulbous per. with weak leafy sts. 1 ft. or more long: lfts. 3, 2-lobed: fls. with yellowish tube and purple limb, to ¾ in. long, solitary. S. Afr.

hirta. Erect or decumbent, st. branched and leafy, pubescent: lfts. 3, mostly spatulate or narrow-cuneate: fls. violet or purple, single on long axillary peduncles. S. Afr.

lasiandra. Scapose per. with simple scaly bulbs: lfts. 5–10, 3 in. long, entire: fls. crimson, in crowded umbels. Mex.

Martiana. Scapose per. with rather shallow loosely scaly compound bulb: lfts. 3, obcordate: fls. to ¾ in. long, rosy, in loose mostly compound umbels. Trop. Amer.

montana (*O. americana*). American W. The American representative of *O. Acetosella:* scapose, summer-blooming in cool northern woods: lfts. 3, obcordate: petals oblong, emarginate, pale pink or white and purple-veined.

oregana. Lvs. and scapes from creeping rootstock: lfts. 3, obcordate, to 2 in. wide: fls. white or rose veined with purple. Wash. to Calif.

Ortgiesi. Per. to 1½ ft., leafy-stemmed: lfts. 3, fish-tailed at end, very broad: fls. yellow with darker veins, in cymes on long axillary peduncles. Andes of Peru.—Seen in greenhouses.

purpurea: *O. Bowieana.*

rosea. Erect tall per.: lfts. 3, obcordate, petioles 1 in. or less long: fls. rosy with darker veins, in spring, long-stalked in open cymes. Chile.—Probably much of the cult. material under this name is *O. rubra.*

rubra. Scapose per. with thick stock: lfts. 3, obcordate: fls. pink or rose with darker veins, varying to lilac or white, in compound umbels above the foliage. Brazil.—Frequent window-garden plant, and in the open in mild regions.

stricta (*Xanthoxalis stricta*). Per., erect: lfts. 3, obcordate: fls. small, yellow, pedicels reflexed in fr. Old World; scarcely cult.; common weedy plant in N. Amer., Bermuda and elsewhere.

tetraphylla (*Ionoxalis tetraphylla*). Scapose per. with simple scaly bulbs: lfts. usually 4, obcordate: fls. lilac or rosy, in simple umbels. Mex.

tropæloides: *O. corniculata* var. *atropurpurea.*

valdiviensis. St. short, per. but grown as ann.: lfts. 3, obcordate: fls. bright yellow striped with brown inside, in umbels on long peduncles. Chile.

variabilis. Scapose bulbous per.: lfts. 3, ciliate, not notched: fls. showy, white, rose or violet, to 2 in. across, yellow at base. Cape of Good Hope; persists in S. Calif.

violacea (*Ionoxalis violacea*). Scapose per. with scaly brown bulbs: lfts. 3, broadly notched: fls. violet or rose-purple (seldom white), several on peduncles usually exceeding lvs. Mass. to Fla. west to Rocky Mts.—Rarely cult. but useful in borders and rock-gardens.

OXALIS, BLUE: *Parochetus communis.*

OXERA. *Verbenaceæ.* Shrubs, often climbing, with opposite entire lvs. and white or yellowish fls. in clusters; one sometimes grown in greenhouses or out-of-doors in S. Calif. Requires a winter temperature of 55–60°. Propagated by cuttings and seeds.

pulchella. Climbing: lvs. oblong-lanceolate, to 5 in. long: fls. trumpet-shaped, white, 2 in. and more long, with conspicuous calyx and long-exserted stamens. New Caledonia.

OX-EYE: *Buphthalmum.*

OXLIP: *Primula elatior.*

OXYANTHUS ISTHMIA: *Posoqueria latifolia.*

OXYBAPHUS: *Allionia.*

OXYCOCCUS: *Vaccinium.*

OXYDENDRUM (sometimes but not originally spelled *Oxydendron*). *Ericaceæ.* One deciduous tree to 60 ft., planted for ornament and hardy N. but of slow growth. Propagated by seeds. **O. arboreum** (*Andromeda arborea*). Sour-Wood. Sorrel-Tree. Lvs. oblong-lanceolate, to 8 in. long, turning scarlet in autumn: fls. white, ⅓ in. long, in terminal drooping panicles to 10 in. long, July–Aug.: fr. a small gray-pubescent caps. Pa. to Fla. and La.

OXYLOBIUM. *Leguminosæ.* Australian shrubs with simple entire usually whorled or opposite lvs., yellow or purple papilionaceous fls. in racemes, and swollen pods; one species sometimes planted in Calif.

Callistachys (*Callistachys ovata*). Tall shrub: lvs. ovate-oblong to lanceolate, to 5 in. long, leathery: fls. yellow, in dense terminal racemes to 6 in. long: pods leathery, ½ in. or more long.

OXYPETALUM (*Tweedia*). *Asclepiadaceæ.* S. American herbs or subshrubs with opposite lvs. and fls. in umbels or heads, corolla deeply 5-parted, the corona of 5 scales; one species intro. into S. U. S.

cæruleum. Twining, herbaceous: lvs. oblong, cordate at base: fls. blue with darker blue fleshy corona, about 1 in. across, in axillary 3–4-fld. clusters. Argentina.

OXYTROPIS (*Aragallus*). *Leguminosæ.* Per. herbs or shrubs somewhat like Astragalus, with pinnate lvs., papilionaceous fls. in racemes or spikes, and cylindrical pods; sometimes grown in rock-gardens. Propagated by seeds or division.

campestris. To 1 ft.: fls. pale yellow tinged with purple, in short spikes. N. Eu., Asia and Amer.

Halleri: *O. uralensis.*

Lambertii. Loco Weed. To 1½ ft., silky-pubescent: fls. bluish-purple, in racemes to 4 in. long. Minn. to Mont.

montana. To 6 in.: fls. purple, in short racemes. Eu.

splendens. To 1½ ft., densely silky-pubescent: fls. deep purple, in dense spikes to 4 in. long. Minn. to Sask. and New Mex.

uralensis (*O. Halleri*). To 6 in., covered with silky hairs: fls. bright purple, in short spikes. N. Eu. and Asia.

villosus. To 6 in., silky-pubescent: fls. creamy, in dense spikes 2 in. long. Mont., S. D.

OXYURA: *Layia chrysanthemoides.*

OYSTER-PLANT: *Tragopogon porrifolius.* Spanish: *Scolymus hispanicus.*

OYSTER, VEGETABLE: *Tragopogon porrifolius.*

P

PACHIRA. *Bombacaceæ.* Trop. American trees with digitately compound lvs., large pink, white or brownish fls. with abundant long showy stamens, and capsular frs., the seeds sometimes eaten; ornamental subjects in the far S. Propagated by seeds or cuttings.

aquatica (*Carolinea princeps*). GUIANA-CHESTNUT. Large tree: lfts. 5–7, oblong-lanceolate, to 1 ft. long: fls. solitary, pinkish or purplish, to 14 in. long, with numerous slender stamens: fr. 1 ft. or more long. S. Amer.

PACHISTIMA. *Celastraceæ.* N. American evergreen small shrubs bearing opposite simple leathery lvs., small reddish bisexual fls., and capsular frs.

Pachistimas may be transferred into the border, wild-garden or rock-garden where they thrive in any well-drained soil. Propagated by seeds, layers, cuttings under glass, and *P. Canbyi* also by division. They are hardy in southern New England.

Canbyi. To 1 ft., trailing: lvs. narrowly oblong, to 1 in. long and less than ¼ in. broad, sides nearly parallel, the margins revolute, minutely serrulate toward apex. Mts. of Va. and W. Va.

Myrsinites. To 3 ft.: lvs. ovate, oval to lance-elliptic, to 1¼ in. long, broad, toothed, often acute. B. C. to Calif.

PACHYCEREUS. *Cactaceæ.* Tree-like columnar and ribbed Mexican spiny cacti of 10 species differing from Cereus in bearing scales on ovary and fl.-tube with felt and bristles in their axils and fr. bur-like and dry: fls. diurnal, stamens included: plants usually bearing dense wool or felt. See *Cacti.*

chrysomallus (*Cereus chrysomallus*). Much branched with age, the erect branches making a compact top to 15 ft. through and to more than 50 ft. high, glaucous, ribs 11–14, radial spines about 12, centrals 3: fls. cream-color, about 2½ in. long, concealed in long brownish wool.

Columna-Trajani (*Cereus Columna-Trajani*). TRAJANS COLUMN. St. often simple (at least below), to 20 in. diam. and 40–50 ft. high, ribs many and green, areoles with brown felt, radials 8–10, centrals longer: fls. purple.

marginatus (*Cereus marginatus. C. gemmatus*). ORGAN-PIPE CACTUS. To 20 ft. and commonly simple, ribs 5–7 and white-cushioned, spines 5–8 or more, 1 central: fls. brownish-purple, funnelform, about 1½ in. long.

pecten-aboriginum (*Cereus pecten-aboriginum*). HAIR-BRUSH CACTUS. To 30 ft., trunk to 6 ft. and 1 ft. diam., with many erect branches, ribs 10 or 11 and tomentose, spines 8–12, 1–3 central: fls. white inside and purple outside, 2 in. or more long.—The large frs. are sometimes used by Indians as hair-brushes, whence the Latin name.

Pringlei (*Cereus Pringlei*). To 30 ft. and more, trunk 3–6 ft. and 2 ft. or more diam., sometimes nearly simple but often with many upright branches, ribs 11–17, areoles brown-felted, spines 20 or more on young parts but often absent in old plants: fls. white, to 3 in. long.

PACHYLOPHUS: *Œnothera.*

PACHYPHYTUM. *Crassulaceæ.* Mexican succulent herbs with very thick lvs. and fls. solitary or in one-sided racemes, differing from Cotyledon in having the petals appendaged at the insertion of the stamens; sometimes grown in greenhouses and perhaps in the open in warm regions.

bracteosum (*Cotyledon Pachyphytum*). About 1 ft. tall, glaucous-blue: lvs. mostly in rosettes on st., obovate: fls. red, in racemes to 6 in. long.

PACHYRHIZUS. YAM BEAN. *Leguminosæ.* Herbaceous vines having large tuberous roots, trifoliolate lvs., papilionaceous fls. in clusters on long axillary racemes, and flattened pods.

Yam beans are grown in warm countries for the edible roots and pods. Propagated by seeds. Vines should be supported by sticks or otherwise.

erosus. At least the terminal lft. lobed: fls. violet: pods 4–6 in. long. Tropics.

tuberosus. Lfts. entire: fls. white: pods 8–12 in. long. Tropics.

PACHYSANDRA. *Buxaceæ.* Procumbent per. hardy herbs or subshrubs, evergreen or deciduous, with simple lvs., monœcious apetalous fls. in spikes, and capsular frs.; planted as ground-cover in shady locations. Propagated by cuttings in summer.

procumbens. ALLEGHANY P. or SPURGE. To 1 ft.: lvs. mostly deciduous, entire or toothed above middle: fls. greenish or purplish, in spikes from the base of the sts., Apr.–May. W. Va. to Fla. and La.

terminalis. JAPANESE P. or SPURGE. To 12 in.: lvs. evergreen, toothed above middle: fls. white, in terminal spikes, in May. Japan. Var. variegata has lvs. bordered and variegated with white.—This species is now much employed for ground-cover.

PACHYSTACHYS. *Acanthaceæ.* Shrubs of trop. Amer. distinguished from Jacobinia by technical differences in the pollen and stamens, and of the same cultural requirements.

coccinea (*Jacobinia* and *Justicia coccinea*). To 7 ft.: lvs. ovate or oval, to 8 in. long, entire: fls. scarlet, 2 in. long, deeply 2-lipped, in dense terminal heads. Trinidad, S. Amer.

PACHYSTEGIA. *Compositæ.* One New Zealand shrub distinguished from Olearia by technical characters of involucre and pappus. **P. insignis.** To 6 ft.: lvs. crowded at ends of branches, to 7 in. long and 4 in. across, entire, very thick and leathery, shining above, densely tomentose beneath: heads to 3 in. across, of white ray-fls. and yellow disk-fls. Planted in Calif.

PADUS RACEMOSA: *Prunus Padus.*

PÆONIA. PEONY. *Ranunculaceæ.* Per. herbs or low shrubs with tuberous or thickened rootstocks, large alternate compound lvs., usually large solitary red, purple, white or yellow fls., and dehiscent follicular frs.;

mostly native in Eu. and Asia.—The commonly cult. peonies are mostly the issue of *P. albiflora* and *P. suffruticosa.*

Peonies are amongst the most popular flower-garden subjects and are very hardy, blooming in spring and early summer. They thrive in any soil, but fertile loam is best and as they are gross feeders they should be given a top dressing in late fall which is worked into the soil in spring. Propagated by division of clumps in late summer or autumn, layers and cuttings; also by seeds which will not produce bloom for about three years and are not expected to reproduce the parent exactly. Varieties may be propagated by grafting on a piece of tuber with eyes removed in late summer or early autumn, stored over winter, and planted out in spring. Peonies may also be forced in the greenhouse.

albiflora (*P. edulis*). To 3½ ft., with spindle-shaped tuberous roots: lvs. biternate, the lfts. oblong to lanceolate, entire, long-acuminate, usually veined with red: fls. originally white or pink but now in many colors as most of the named garden forms belong here, to 6 in. across: fr. of 3–5 commonly glabrous follicles. Siberia, China, Japan. Var. festiva has double white fls. marked in center with carmine. Var. **sinensis** (*P. chinensis*) has large double crimson fls.

anomala. To 3 ft., with tuberous roots: lvs. biternate, the lfts. lanceolate or linear-lanceolate, acuminate, often lobed: fls. bright crimson, about 4 in. across: fr. of 3–5 glabrous or tomentose follicles. N. Eu., Asia. Var. **insignis** has magenta fls. with crimson stigmas.

arborea: *P. suffruticosa.*

Brownii. To 16 in.: lvs. ternate or biternate, the lobes obovate, glaucous: fls. brownish-red, to 1½ in. across: fr. of 3–5 glabrous follicles. B. C. to Calif. and Utah.

chinensis: *P. albiflora* var. *sinensis.*

corallina. To 4 ft., with tuberous roots: lvs. mostly biternate, lfts. elliptic-lanceolate, entire, acute: fls. purple to whitish, about 4 in. across: fr. of usually 5 tomentose follicles becoming glabrous. S. Eu.

decora. To 3 ft., with oblong tuberous roots: lvs. pale green, lfts. oblong, entire, obtuse: fls. deep purple, about 4 in. across: fr. of 2–3 tomentose follicles. S. Eu. Var. **Pallasii** has narrower lfts. and crimson fls.

Delavayi. Stoloniferous subshrub to 3 ft.: lvs. bipinnate, the lfts. ovate-lanceolate to lanceolate, entire or toothed: fls. dark crimson, 2 in. across: fr. of 5 glabrous follicles. W. China.

edulis: *P. albiflora.*

Humei: *P. suffruticosa* var.

lutea. Subshrub to 3 ft.: lvs. pinnate into obovate-oblong cut or lobed lfts.: fls. golden-yellow, to 4 in. across: fr. of 3 glabrous follicles. China.

microcarpa. To 1½ ft.: lvs. bipinnate into oblong acute lfts. very pubescent beneath: fls. bright crimson, to 5 in. across: fr. of 2 glabrous follicles. Mts. of Spain.

Moutan: *P. suffruticosa.*

officinalis. To 3 ft.: lvs. mostly biternate, lfts. oblong-lanceolate, lobed, obtuse or short-acute: fls. dark crimson varying to white or yellowish, about 4 in. across: fr. of 2–3 white-tomentose follicles. S. Eu., W. Asia. Double forms are vars. **albo-plena, roseo-plena, rubro-plena.** Var. **festiva** has white fls. with red centers.

paradoxa. Probably only a form of *P. peregrina,* differing in the smaller lvs. glaucous and whitish beneath. S. Eu.

peregrina. To 2 ft.: lfts. oblong, acute, pilose beneath: fls. bright crimson, to 4 in. across: fr. of 2–3 tomentose follicles. Eu.

suffruticosa (*P. arborea. P. Moutan*). Tree P. Much branched shrub to 6 ft.: lvs. biternate, the lfts. ovate, 3–5-lobed, glaucous beneath: fls. red, rose or white, to 1 ft. across: fr. of numerous densely pubescent follicles. China. Var. **Humei,** fls. whitish with dark center, partially double. Var. **papaveracea,** fls. white with purple blotch at base of petals, nearly single. Var. **rosea,** fls. bright rose.

tenuifolia. To 1½ ft., with creeping rootstocks: lvs. ternate, the lfts., narrow-linear: fls. dark crimson or purple, 3–4 in. across: fr. of 3–4 pubescent follicles. S. E. Eu., W. Asia.

Wittmanniana. To 3 ft.: lvs. biternate, the lfts. ovate, pubescent beneath: fls. yellow to whitish, 4 in. across: fr. of 2–3 glabrous follicles. Caucasus.

PAGODA-TREE, JAPANESE: *Sophora japonica.*

PAINT-BRUSH, DEVILS: *Hieracium aurantiacum.* Indian: *Castilleja californica.*

PAINTED-CUP: *Castilleja.* -Tongue: *Salpiglossis sinuata.*

PAK-CHOI: *Brassica chinensis* and *parachinensis.*

PALAFOXIA: *Polypteris Hookeriana.*

PALAQUIUM. *Sapotaceæ.* Large trees with milky juice from which gutta-percha is obtained, alternate leathery lvs., small 6-lobed fls. in clusters, and fr. a fleshy berry; native in E. Indies and Malaya.

Gutta (*Isonandra Gutta*). To 40 ft.: lvs. oval, 4 in. long, rusty-tomentose beneath. Malaya.—Sometimes planted in warm countries for ornament and interest.

PALICOUREA. *Rubiaceæ.* Shrubs or trees of trop. Amer., with opposite lvs., small tubular fls. in terminal panicles, and fr. a small drupe. Sometimes planted for ornament far S.

barbinervia. Shrub or tree to 25 ft.: lvs. elliptic, to 10 in. long, shining above: fls. white, corolla tomentose. W. Indies.

crocea. Shrub to 10 ft.: lvs. ovate or elliptic, to 8 in. long: fls. red, corolla glabrous: fr. dark brown or black. W. Indies, S. Amer.

PALI-MARA: *Alstonia scholaris.*

PALISOTA. *Commelinaceæ.* Trop. African per. herbs having parallel-veined lvs. edged with reddish hairs, white, rose or bluish fls. in panicles that are sometimes nearly hidden at base of foliage, and fr. a purple or red berry; rarely grown in greenhouse collections. Propagated by cuttings over heat, or by seeds.

Barteri. Lvs. to 2 ft. long and 4½ in. wide, mostly basal: fls. dark purplish.

Pynaertii. Sts. short: lvs. to 1½ ft. long and 6 in. wide, gray-pubescent: fls. white, in dense infl. to 3 in. long.

PALIURUS. *Rhamnaceæ.* Spiny trees or shrubs with alternate simple lvs., small fls. in cymes, and spherical small fr. with a broad wing or rim surrounding it making a dry disk-like object with raised center; grown for ornament but not hardy north of Washington.

The one species commonly grown (*P. Spina-Christi*) needs a sunny position and well-drained soil. Propagated by seeds sown in autumn or stratified, by layers and root-cuttings.

aculeatus: *P. Spina-Christi.*

orientalis. Tree to 40 ft. or more, often spineless, with lvs. much larger than the following species and fr. broader. China.

Spina - Christi (*P. aculeatus*). Christ-Thorn. Jerusalem-Thorn. To 20 ft., with straight and hooked spines: lvs. ovate, to 1½ in. long, mostly finely toothed, 3-ribbed: fls. greenish-yellow: fr. brownish-yellow, to 1 in. across. S. Eu. to N. China.

PALM, PALMACEÆ. Highly ornamental and decorative evergreen and mostly evergrowing woody plants, much prized in the juvenile state under glass and extensively planted in tropical and warm-temperate regions around the globe, many of them yielding economic products of great importance, probably at least 170 genera as at present defined and perhaps 1,500 species or more. In general, the palms are not well understood botanically as to species and varieties. They are mostly tree-like, but some of them are extensive climbers and others are bushes. The trunk or caudex is various in character, although of endogenous internal structure. In some species the caudex is wholly subterranean. In most cases the trunk is unbranched, but in Hyphæne and a few others it may be naturally forked, sometimes extensively. Multiple heads now and then occur in various palms, following injury. The flowers of palms are small but commonly numerous, bisexual or unisexual, borne on a simple or usually branching spadix or inflorescence that is mostly contained in or subtended by a simple or multiple spathe, the plant often monœcious or sometimes diœcious; the spadix is borne among the leaves in some genera, below them in others, and sometimes above the crown; the fruit is exceedingly various, from nuts small or large, drupes, berry-like and dry seed-like bodies.

To the general observer and the horticulturist the palms fall into two groups, (1) the fan-leaved or palmate kinds, (2) the feather-leaved or plumose in which the veining or the division is pinnate on either side a continuing rachis; these distinctions, however, do not hold strictly, for there are intermediate types and a botanical classification might not give them primary importance. For careful discrimination the flowers and flowering habit, and the fruits, must be known. Under glass, the palms are seen mostly in the juvenile or virgin state and their exact identification may be difficult or impossible.

The number of palms planted in the continental United States is far greater than is commonly supposed. In this book, more than 200 species are accounted for as represented in the country, aside from duplicate names, as in the following genera (duplicate or unaccepted generic names being in parentheses): Acanthophœnix, Acanthorhiza, (Acanthosabal), Acœlorraphe, (Acrista), Acrocomia, Actinophlœus, Adonidia, (Aeria), Allagoptera, Archontophœnix, Areca, Arecastrum, Arenga, Arikuryroba, Astrocaryum, Attalea, Bactris, Balaka, Bismarckia, Borassus, Brahea, Butia, Calamus, Caryota, Ceroxylon, Chamædorea, Chamærops, Chambeyronia, Chrysalidocarpus, Coccothrinax, Cocos, Colpothrinax, Copernicia, Corypha, Cyrtostachys, Dæmonorops, Deckenia, (Denea), Desmoncus, Dictyosperma, (Diplothemium), (Drymophlœus), (Dypsis), Elæis, (Eora), Erythea, Euterpe, Gaussia, Geonoma, Guilielma, Hedyscepe, Heterospathe, Howea, Hydriastele, Hyophorbe, Hyphæne, Juania, Jubæa, Kentia, Kentiopsis, Korthalsia, Latania, Licuala, Linospadix, Livistona, Lodoicea, Malortiea, Martinezia, Nannorhops, Nipa, Normanbya, (Oreodoxa), (Paurotis), (Phœnicophorium), Phœnix, Phytelephas, Pinanga, Polyandrococos, Pritchardia, Pseudophœnix, Ptychoraphis, Ptychosperma, (Pyrenoglyphis), Ranevia, Raphia, Rhapidophyllum, Rhapis, Rhopalostylis, Rhyticocos, Roscheria, Roystonea, Sabal, Scheelea, (Seaforthia), Serenoa, Stevensonia, (Styloma), Syagrus, Synechanthus, Thrinax, (Thrincoma), Trachycarpus, Trithrinax, Veitchia, Verschaffeltia, Wallichia, Washingtonia. Studies in recent years have made important changes in palm nomenclature, and further elucidation is to be expected.

Other groups than these are undoubtedly in test grounds within the confines of the continental United States, but probably these more than 90 genera comprise the kinds that have attained currency or have been represented in trade-lists or American horticultural literature. Some of these palms are known only as under-cover subjects, although most of them (if not all) are now planted somewhere within our limits in the open or under lath (the lath providing protection from sun and wind as well as from cold). In some cases they are yet known only as small seedlings, with their adaptabilities still to be determined. The number in cultivation will increase as the capabilities are better known in southern Florida, southern California, and on the Gulf coasts between, and as the interest in palms expands.

The above genera represent most palm regions of the world. In the United States, 10 genera are native, with nearly or quite 20 species, most of them Floridian. California has one species of Washingtonia, Texas two or three species of Sabal. No palms are known to be native in Arizona and New Mexico except one station for Washingtonia in the former. In the middle Gulf coast country, Sabal and Serenoa are represented; and the palmetto extends as far, on the Atlantic coast, as central North Carolina.

Formerly many kinds of palms were grown in greenhouses and for decoration in residences but the number is now reduced mostly to those that can be grown in large quantity and striking uniformity, as the Howeas, *Chrysalidocarpus lutescens*, *Syagrus Weddelliana*, *Phœnix Roebelenii* and *P. canariensis*, all feather-palms; but in very mild climates for patio and lath-house use a larger range of pot and tub subjects is available; and many of the species are adaptable for house use in the hands of the amateur. In general, palms are easy to manage as pot subjects, and when they become too large or begin to fail they may be discarded for younger plants, these plants being purchased from dealers. They thrive in partial shade. Transplanting or shifting to other pots should be undertaken preferably only when the roots are active, as in spring and summer. A common fault is to shift too frequently into too large pots, as this may check growth and orderly development and may result in over-watering. Although the growing young palm requires constant moisture, it suffers quickly from an excess and from poor drainage. Well-rotted sod is a good basis for palm soil with which may be mixed a little old manure or leaf-mold and sufficient sand or peat to keep it rather light, sweet and open. Most palms grow readily from good seed, in a mild heat under glass. The young seedlings of most kinds thrive in a night temperature of about 60° F. or a little under, and 10 to 20° higher in the day. In summer, potted palms may be plunged in the open in partial shade well protected from wind. Only very few of the house palms can be propagated from suckers, although this is the only way of procuring named varieties of dates in orchard planting for fruit; but for house decoration, young date palms may be readily raised from seeds of the commercial fruits.

The palms have large uses in landscape planting in climates adapted to them, but they are commonly very poorly placed for the best effect; the subject needs careful study by competent artists. A palm, as any other plant, is not pleasing unless thrifty and exhibiting the characteristics of its kind. Often the plants are neglected or carelessly grown; and if placed where they must be constantly trimmed of their leaves they soon lose character and become valueless. For permanent planting, palms should be moved only when roots are active and may reëstablish themselves; yet persons think that because they are evergreen they may be moved with impunity at any time. Palms require good soil and, at least in the growing season, plenty of water, to produce their full verdure. When the ground is naturally thin and poor, abundant stable-manure or other fertilizer may be thoroughly mixed with the soil, and an annual top-dressing added. In other words, palms require as good treatment as other plants if they are to come to their best; and the intending grower should understand something of the countries from which they come as an index to their requirements in temperature and moisture.

The palm family was well defined as *Palmaceæ* by Lindley in "The Vegetable Kingdom" in 1846. The name is mostly written *Palmæ*, however, in the books. This form was used by Linnæus, and continued by Jussieu in his Genera Plantarum in 1789; but this is merely the plural of Latin *palma*, a word that was employed in a general sense by the early botanists, as *rosæ* is the plural of *rosa*. Jussieu similarly wrote *Lilia* and *Junci* as plural group names for which in later time Liliaceæ and Juncaceæ are preferred, connoting definite family associations. The names Arecaceæ and Phœnicaceæ have been revived recently for the palm family, but they suggest to the reader classes of palms rather than the family as a whole, and seem to lack scope.

PALM, ARIKURY: *Arikuryroba.* **Assai:** *Euterpe edulis.* **Barrel:** *Colpothrinax Wrightii.* **Betel:** *Areca Cathecu.* **Black:** *Normanbya Normanbyi.* **Blue, Mexican:** *Erythea armata.* **Bottle:** *Colpothrinax Wrightii, Hyophorbe amaricaulis.* **Cane:** *Calamus.* **Carnauba:** *Copernicia cerifera.* **Cluster:** *Actinophlœus Macarthuri.* **Doum, Egyptian:** *Hyphæne thebaica.* **Everglade:** *Acœlorraphe Wrightii.* **Fan, Chinese:** *Livistona chinensis.* **Fish-tail:** *Caryota.* **Fountain:** *Livistona chinensis.* **Guadalupe:** *Erythea edulis.* **Ivory-Nut:** *Phytelephas macrocarpa.* **King:** *Archontophœnix.* **Llume:** *Gaussia attenuata.* **Manicole:** *Euterpe edulis.* **Mazari:** *Nannorrhops Ritchieana.* **Needle:** *Rhapidophyllum.* **Nikau:** *Rhopalostylis sapida.* **Oil, African:** *Elæis guineensis.* **Palmyra:** *Borassus flabellifer.* **Piccabeen:** *Archontophœnix Cunninghamiana.* **Pignut:** *Hyophorbe.* **Queen:** *Arecastrum Romanzoffianum.* **Rattan:** *Calamus.* **Rootspine:** *Acanthorhiza.* **Royal:** *Roystonea.* **Sago:** *Cycas revoluta.* **Saw-Cabbage:** *Acœloruaphe Wrightii.* **Spindle:** *Hyophorbe Verschaffelti.* **Sugar:** *Arenga saccharifera.* **Syrup:** *Jubæa chilensis.* **Talipot:** *Corypha umbraculifera.* **Wax:** *Ceroxylon andicola.* **Windmill:** *Trachycarpus Fortunei.* **Wine:** *Caryota urens.*

PALMA CHRISTI: *Ricinus communis.*

PALMATE: lobed or divided or ribbed in a palm-like or hand-like fashion; digitate, although this word is usually restricted to leaves compound rather than merely ribbed or lobed.

PALMATIFID: cut about half way down in a palmate form.

PALMERELLA. *Lobeliaceæ.* Per. lobelia-like herbs native in Mex. and Calif., with alternate simple lvs., fls. in terminal racemes, the corolla with long straight tube and spreading 2-lipped limb, and fr. a caps.

debilis. To 2 ft., glabrous: lvs. linear-lanceolate, to 3 in. long, entire: fls. whitish with light blue limb, ¾ in. long. Var. **serrata** has sharp-toothed lvs.

PALMETTO: *Sabal.* **Saw-:** *Serenoa.* **Scrub-:** *Serenoa.*

PALO VERDE: *Cercidium Torreyanum.*

PANAX. GINSENG. *Araliaceæ.* Per. herbs native in N. Amer. and E. Asia, having digitately compound lvs. borne in whorls, small greenish polygamous fls. in terminal umbels, and berry-like frs.; grown for the roots which are employed in medicine. The species of Polyscias are sometimes known as Panax.

Ginseng seed should be sown in drills or broadcast in beds in light well-drained loam. Seedlings should be transplanted the first or second year. Seeds should be stratified until ready for use.

anomalum: *Nothopanax anomalum.*

crassifolium: *Pseudopanax crassifolium.*

ferox: *Pseudopanax ferox.*

Ginseng: *P. Schinseng.*

Lessonii: *Pseudopanax Lessonii.*

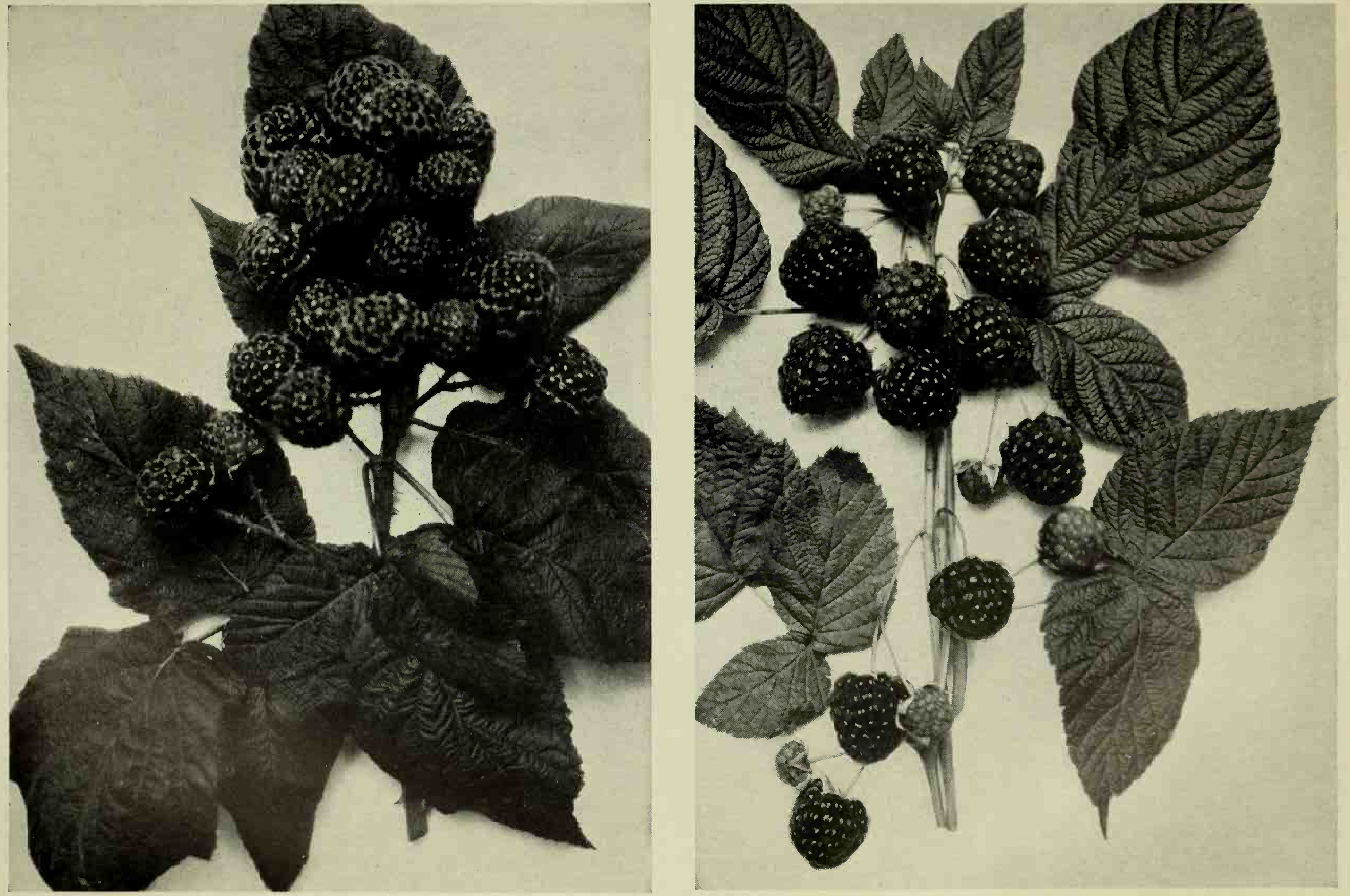
quinquefolium (*Aralia quinquefolia*). AMERICAN G. To 1½ ft.: lvs. of 5 somewhat obovate abruptly acuminate coarsely toothed lfts. to 5 in. long. Que. to Mo.—The common species in cult. in N. Amer.

Schinseng (*P. Ginseng*). ASIATIC G. Lvs. of 5 oblong-ovate gradually acuminate finely double-serrate lfts. to 4 in. long, having conspicuous white bristles on veins above. Manchuria, Korea.

trifolium (*Aralia trifolia*). DWARF G. GROUNDNUT. To 8 in.: lvs. of 3–5 toothed lfts. to 1½ in. long. N. S. to Ga. and Wis.

PANCRATIUM. *Amaryllidaceæ.* Old World mostly summer-flowering bulbs with basal lvs. and white fls. in umbels terminating the solid scapes, the perianth with long tube and narrow segms., the stamens united at base into a cup or crown. Plants grown under this name are likely to be Hymenocallis, which differs in technical botanical characters.

Pancratiums should be kept in a night temperature of 60–70° and well watered. Bulbs should be rested and kept dry through the winter. In late winter they may be repotted or given a top dressing. Propagated by offsets or seeds.



XII. Raspberries. — Black (or blackcap) raspberry at left; red raspberry at right

calathinum: *Hymenocallis calathina.*

illyricum. Lvs. strap-shaped, to 2 in. wide: fls. on scapes 1 ft. or more long, with green tube 1 in. long and segms. 1½ in. long, crown toothed, ¼ in. long, filaments of stamens to ¾ in. long. Medit. region.

maritimum. Lvs. to 2½ ft. long, linear, evergreen: fls. very fragrant, with tube to 3 in. long and linear segms. 1½ in. long: crown with short teeth, 1 in. long, the filaments of stamens short. Medit. region.

PANDANACEÆ. Screw-Pine Family. Rather woody plants, related to palms, usually shrub-like or trees, with simple mostly stiff sword-like lvs. borne at tips of branches, and sometimes producing aerial roots; stamens and pistils separate and not in definite fls., and fr. a cone- or ball-like body; 4 genera in Old World tropics and warm regions, of which Freycinetia and Pandanus are known to hort. in N. Amer.

PANDANUS. Screw-Pine. *Pandanaceæ.* Shrubs and trees with stiff usually prickly-margined lvs., fls. in spikes, naked, and fr. a mass of woody drupes or nuts: the lvs. are arranged in a spiral way, whence the name screw-pine. Lvs. used for bags and the like in some cases.

Screw-pines may be planted out-of-doors in tropical or semi-tropical regions, and are grown in greenhouses and window-gardens in the juvenile state, in pots and tubs, for house and table decoration. They require abundant moisture and heat, and will thrive in conditions suitable for palms. Propagation is by suckers that arise about the base, placed in pots over bottom heat, or by seeds when procurable; the latter should be soaked for twenty-four hours, planted in pots and given water and shade.

Baptistii. St. short: lvs. 1 in. wide, unarmed, striped with white or yellow. New Britain Isls.

caricosus. Low, tufted: lvs. to 2 in. wide, glaucous beneath, margins finely spiny-toothed. Java.

gracilis. Shrub: lvs. imbricated, keeled, margins and midrib above with incurved prickles. Philippine Isls.

graminifolius. Lvs. about ⅕ in. wide, glaucous beneath. Burma.—The plant commonly cult. under this name is *P. pygmæus.*

javanicus: a name of no botanical standing; possibly *P. variegatus.*

pacificus. Lvs. broad, glossy dark green, with tail-like tip. Pacific Isls.

pygmæus. St. to 2 ft.: lvs. about ⅓ in. wide, glaucous beneath, long-pointed. Madagascar.

Sanderi. St. short: lvs. 2 in. or more wide, banded lengthwise with golden-yellow. Timor.

tectorius. Tree to 20 ft., with brace-roots: lvs. to 2 in. wide, glaucous-green, long-pointed. Asia, Australia, Pacific Isls.

utilis. Branching tree to 60 ft., with brace-roots: lvs. 3 in. wide, glaucous-green with reddish spines. Madagascar, where it is used for making baskets and other articles.—The species is usually planted in frostless countries.

variegatus. St. with brace-roots: lvs. striped or variegated with white or young lvs. entirely white. Polynesia.

Veitchii. Lvs. to 3 in. wide, banded lengthwise near the margins with silvery-white. Polynesia.—The most popular house and florists pandanus.

PANDOREA. *Bignoniaceæ.* Evergreen climbing shrubs native in Old World tropics, with pinnate lvs., funnelform white or pink fls. in panicles, and fr. an oblong pod.

Pandoreas are grown out-of-doors in southern United States, but may withstand a little frost. They require rich soil and sunny exposure. Propagated by seeds, and by cuttings of green wood under glass.

australis: *P. pandorana.*

Brycei (*Tecoma Reginæ-Sabæ*). Lvs. of 9–11 lanceolate long-pointed entire lfts. to 2 in. long: fls. pale pink marked with red and throat yellow, 1¼ in. long and 2 in. across, in many-fld. panicles. Rhodesia.

jasminoides (*Bignonia* and *Tecoma jasminoides*). Bower-Plant. Lvs. of 5–9 ovate to lanceolate entire lfts. to 2 in. long: fls. white with pink throat, to 2 in. long, in few-fld. panicles. Australia.

pandorana (*P.*, *Bignonia*, and *Tecoma australis*). Wonga-Wonga Vine. Lvs. of 3–9 ovate to ovate-lanceolate nearly entire lfts. to 2½ in. long: fls. yellowish-white spotted with purple, ¾ in. long, in many-fld. panicles. Malasia, Australia. Var. **rosea** has pale rose fls.

Ricasoliana (*Tecoma Ricasoliana. T.* and *Bignonia Mackenii*). Lvs. of 7–11 ovate short-pointed toothed lfts. 1 in. long: fls. pale pink striped with red, 2 in. long, in loose panicles. S. Afr.

PANICLE: flower-cluster in which the branches are racemose, the flowers being pedicellate: a branching raceme.

PANICULARIA: *Glyceria.*

PANICUM. *Gramineæ.* A large and widely distributed group of ann. and per. grasses, the spikelets borne in panicles or rarely racemes; a few species are grown for grain and forage and others for ornament. See *Grasses.*

barbinode. Para-Grass. Per. to 10 ft., stoloniferous and rooting at nodes: lvs. to 1½ ft. long and ½ in. wide, rough on edges: panicles to 1 ft. long, the branches ascending. Brazil, but escaped in trop. Amer.—Grown for forage.

capillare. Witch-Grass. Ann. to 2 ft.: lvs. to 1 ft. long and ½ in. wide: panicles to 14 in. long, the branches exceedingly slender and spreading. N. S. to Fla. and Tex., Bermuda.—Sometimes prized for its large capillary infl. and in dry bouquets.

Crus-corvi: *Echinochloa Crus-galli.*

Crus-galli: *Echinochloa Crus-galli.*

excurrens: *Setaria plicata.*

frumentaceum: *Echinochloa Crus-galli* var. *edulis.*

germanicum: *Setaria italica.*

hungariensis: this name presumably applies to the Hungarian-grass, *Setaria italica* var. *nigrofructa.*

maximum. Guinea-Grass. Tufted per. to 10 ft.: lvs. to 2 ft. long and ½ in. wide, midrib whitish: panicles to 2 ft. long, branches spreading. Afr.—Grown for forage in the S.

miliaceum. Millet. Broom-Corn Millet. Ann. to 4 ft.: lvs. to 1 ft. long and 1 in. wide: panicles to 1 ft. long, drooping, the branches slender and crowded: grain smooth and shining, white or straw-colored. E. Indies.—Grown for grain and forage.

palmifolium: *Setaria palmifolia.*

plicatum: *Setaria plicata.*

sulcatum: *Setaria sulcata.*

texanum. Colorado-Grass. Texas Millet. Ann. to 3 ft., soft-pubescent: lvs. to 8 in. long and ¾ in. wide: panicles of one-sided racemes. Tex.

tonsum: *Tricholæna rosea.*

variegatum: the plant intended is probably *Oplismenus compositus* var. *vittatus.*

virgatum. Switch-Grass. Per. to 6 ft.: lvs. to 1 ft. or more long and ½ in. wide, rough on edges: panicles to 1½ ft. long, the branches spreading or ascending. Me. to Fla. and Ariz., W. Indies, Cent. Amer.—Sometimes raised for ornament.

PANSY: see *Viola.*

PAPAVER. Poppy. *Papaveraceæ.* Herbs or rarely subshrubs with milky juice, lobed or dissected lvs., showy red, violet, yellow or white fls. and nodding buds solitary on long stalks, and fr. a caps.

Poppies are popular flower-garden subjects grown as annuals, and others perennial in borders and rock-gardens. Seeds should be sown where the plants are to grow as poppies do not transplant well.

alpinum (*P. Burseri*). ALPINE P. Nearly stemless per. to 10 in. high: lvs. 2–3-pinnate, glaucous: fls. white or yellow, fragrant: caps. oblong. Alps.

altaicum: an unidentified trade name.

apulum. Ann.: lvs. bipinnate: fls. spotted with purple: caps. ellipsoidal. Italy.

Argemone. Ann. to 1 ft.: lvs. bipinnate: fls. pale scarlet, with dark spot at base of petals: caps. oblong-cylindric. Eu., N. Afr.

atlanticum. Hairy per. to 2 ft.: lvs. toothed or pinnate: fls. orange-red or scarlet, to 3 in. across: caps. club-shaped. Morocco.

bracteatum. Hairy per. to 3 ft.: lvs. pinnate, the lobes coarsely toothed: fls. blood-red, to 4 in. across, with bracts near them: caps. obovate. Medit. region to Persia.

Burseri: *P. alpinum.*

californicum. WESTERN P. Ann. to 2 ft.: lvs. pinnate: fls. red spotted with green at base, to 2 in. across: caps. top-shaped. Calif.

caucasicum (*P. fugax*). Glaucous bien. to 2 ft.: lvs. bipinnate: fls. scarlet, yellowish at base: caps. oblong. Caucasus.

dubium. Ann. to 2 ft.: lvs. pinnate: fls. rose or white with darker center: caps. oblong or club-shaped. Eu.; escaped in N. Amer. Var. **lævigatum** is glabrous and has purple usually spotted fls. The plant under this varietal name may be *P. Rhœas.*

fugax: *P. caucasicum.*

giganteum: a form of *P. somniferum.*

glaucum. TULIP P. Ann. to 2 ft.: lvs. pinnately lobed or cut, glaucous: fls. scarlet spotted at base, to 4 in. across. Syria to Persia.

involucratum: an unidentified trade name.

lateritum. Hairy branched per. to 2 ft.: lvs. pinnate: fls. brick-red: caps. obovate. Armenia.

monstrosum: a form of *P. somniferum.*

Mursellii: a strain of *P. somniferum* with double fringed fls.

nudicaule. ICELAND P. Nearly stemless hairy per. to 1 ft. high: lvs. pinnately lobed or cut: fls. white with yellow at base, yellow with green at base, orange or reddish, to 3 in. across, fragrant, sometimes double. Arctic regions. Color forms are grown under such names as **album, aurantiacum, coccineum** and **luteum.**

orientale. ORIENTAL P. Hairy per. to 4 ft.: lvs. pinnate, the lobes sharply toothed: fls. scarlet with black spot at base ranging to orange and pale pink, 6 in. and more across, sometimes double. Medit. region to Persia. Var. **Parkmannii** is a hort. form.

pæoniflorum: a peony-fld. strain of *P. somniferum.*

pavoninum. PEACOCK P. Hairy ann. to 1 ft.: lvs. pinnate, the lobes sharply toothed: fls. scarlet spotted with dark color, 1 in. across. Turkestan, Afghanistan.

pilosum. OLYMPIC P. Hairy per. to 3 ft.: lvs. irregularly toothed: fls. brick-red, 2 in. across. Mt. Olympus in Bithynia.

pyrenaicum (*P. rhæticum*). Tufted nearly stemless per. to 4 in. tall: lvs. pinnately parted: fls. yellow or orange, to 1 in. long: caps. oblong. Pyrenees.

rhæticum: *P. pyrenaicum.*

Rhœas. CORN P. Ann. to 3 ft.: lvs. irregularly pinnate or rarely entire: fls. cinnabar-red, deep purple, scarlet, or sometimes white, 2 in. across. Eu., Asia; nat. in N. Amer.; this is the common field poppy of Eu. Var. **umbrosum** has dark red fls. with blackish spots. Shirley poppies are a strain of this species. Var. **coccineum aureum** is a color form.

rupifragum. Nearly stemless per. to 1½ ft.: lvs. pinnately cut: fls. pale red, to 3 in. across. Spain.

Schinzianum. Gray-hairy per. to 1½ ft.: lvs. obovate-lanceolate, irregularly pinnately lobed: fls. brick-red, 1¼ in. long: caps. obovoid. Habitat unknown.

setigerum. Sometimes treated as a form of *P. somniferum,* but it is hairy, lvs. more deeply cut, and has violet fls. Medit. region.

somniferum. OPIUM P. Ann. to 4 ft.: lvs. coarsely toothed or lobed: fls. white, pink, red or purple, to 4 in. across, sometimes double or with fringed petals. Greece, Orient.—Opium is obtained from the milky juice of the fr.

umbrosum: *P. Rhœas* var.

PAPAVERACEÆ. POPPY FAMILY. Herbs or rarely shrubs, of about 25 widely distributed genera, often showy in bloom, having colored juice, regular bisexual polypetalous fls. with 2–3 caducous sepals, 4–8 or 8–12 free deciduous petals, numerous stamens, superior 1-celled ovary, and fr. a caps. opening by valves or pores. Several genera are grown in the flower-garden, as Argemone, Bocconia, Cathcartia, Chelidonium, Dendromecon, Dicranostigma, Eomecon, Eschscholzia, Glaucium, Hunnemannia, Macleaya, Meconopsis, Papaver, Platystemon, Roemeria, Romneya, Sanguinaria, Stylophorum.

PAPAW: *Asimina triloba;* see *Pawpaw.*

PAPAYA: see *Carica.*

PAPER-BUSH: *Edgeworthia papyrifera.* **-Flower**: *Buginvillæa glabra* var. *Sanderiana.*

PAPHIOPEDILUM. LADY-SLIPPER. *Orchidaceæ.* Trop. American epiphytic or terrestrial orchids with leathery lvs., no pseudobulbs, and fls. in racemes or panicles, the lateral sepals united, lip sac-like with the edges reflexed or turned in; ovary 3-celled; grown in the hothouse and some of them in intermediate temperatures; they require good moisture supply. See *Orchids* for cult. Many of the plants cult. as Paphiopedilum belong to Cordula, which see. The orchids known to hort. as Phragmopedilum and Selenipedium may be sought here.

Ainsworthi (*P. Browni. P. calurum*). Hybrid between *P. longifolium* and *P. Sedeni.*

albopurpureum. Hybrid between *P. Schlimii* and *P. Dominianum.*

barbatum: *Cordula barbata.*

Browni: *P. Ainsworthi.*

calurum: *P. Ainsworthi.*

cardinale. Hybrid between *P. Sedeni* and *P. Schlimii album.*

caricinum. Lvs. 1½ ft. long and ½ in. wide: fls. to 4 in. across, in 3–6-fld. racemes, pale greenish, the segms. tipped with purple and bordered with white, Apr.–July. Peru, Bolivia.

caudatum. Lvs. to 16 in. long and 1 in. wide: fls. in 2–3-fld. racemes on stalks to 3 ft. high, yellow-green marked with brown, the petals sometimes 2–3 ft. long, Apr.–Aug. Peru, Ecuador, Costa Rica.

conchiferum. Hybrid between *P. caricinum* and *P. longifolium* var. *Roezlii.*

Dominianum. Hybrid between *P. caricinum* and *P. caudatum.*

Eastoni. Hybrid between *P. longifolium* and *P. Lindleyanum.*

grande. Hybrid between *P. longifolium* var. *Roezlii* and *P. caudatum.*

Lawrenceanum: *Cordula Lawrenceana.*

leucorrhodum: a form of the hybrid *P. Sedeni.*

Lindleyanum. Lvs. to 2 ft. long and 2½ in. wide: fls. to 3 in. across, in 3–7-fld. racemes, green spotted and striped with red and purple, in autumn and winter. British Guiana.

longifolium. Lvs. to 2 ft. long and 1 in. wide: fls. 7 in. across, in 6–10-fld. racemes, green veined with purple and the lip tinged with brown, in autumn. Costa Rica. Var. **Roezlii** has broader lvs. and petals edged with red.

nitidissimum. Hybrid between *P. caudatum* and *P. conchiferum.*

Roezlii: *P. longifolium* var.

Sargentianum. Lvs. oblong-lanceolate, to 8 in. long: fls. in 2–3-fld. racemes to 6 in. high; sepals green marked with violet; petals whitish spotted with rose; lip greenish and rose, spotted with brown, Sept.–Oct. Brazil.

Schlimii. Lvs. to 10 in. long and ¾ in. wide: fls. in 5–8-fld. racemes, white or rose, blooming all year. Colombia.

Schroederæ. Hybrid between *P. caudatum* and *P. Sedeni.*

Sedeni (*P. tenellum*). Hybrid between *P. Schlimii* and *P. longifolium.*

Spicerianum: *Cordula Spiceriana.*

tenellum: *P. Sedeni.*

Urgandæ. Hybrid between *P. Lindleyanum* and *P. longifolium.*

PAPILIONACEOUS corolla: butterfly-like; pea-like flower, with a standard, wings, and keel.

PAPPUS: peculiar calyx-limb of composites, being plumose, bristle-like, scales, or otherwise.

PAPYRIUS: *Broussonetia papyrifera.*

PAPYRUS: *Cyperus Papyrus.*

PARACARYUM: *Adelocaryum cœlestinum.*

PARADISEA. *Liliaceæ.* One per. herb with fleshy rhizomes and linear basal lvs. **P. Liliastrum** (*Anthericum Liliastrum*). St.-Bruno-Lily. To 2 ft.: fls. white, funnel-shaped, to 2 in. long, in loose racemes on slender bracted scapes. Eu. Var. **major** is taller and has larger fls.—Of easy cult. in the hardy border. Propagated by division and seeds.

PARAMIGNYA. *Rutaceæ.* Several evergreen spiny climbing Indian shrubs: lvs. of 1 lft.: fls. solitary or in axillary clusters, large and white; stamens 8–10, not united: fr. elliptic or globose, gummy inside. **P. monophylla** has alternate lvs. and recurved spines that aid in climbing, and more or less hairy young parts: fr. berry-like, about 1 in. diam., yellow.—Grown experimentally as a Citrus relative.

PARA-NUT: *Bertholletia.*

PARASOL-TREE, CHINESE: *Firmiana simplex.*

PARDANTHUS: *Belamcanda.*

PARIETARIA. Pellitory. *Urticaceæ.* Herbs, widely distributed, with alternate entire lvs. and polygamous fls. in axillary clusters; one species formerly grown for medicinal purposes. Propagated by seeds and cuttings.

arborea: *Gesnouinia arborea.*

officinalis. Erect per. blooming first year, to 1 ft. or sts. prostrate: lvs. ovate to oblong, to 4 in. long: fls. very small, in sessile clusters. Eu., Asia.

PARIS. *Liliaceæ.* Rhizomatous herbs native in mts. of north temp. zone, differing from Trillium in the parts of the fl. in 4's; sometimes planted in hardy border.

quadrifolia. Herb-Paris. To 1 ft.: lvs. in a whorl of 4 about 2 in. below the solitary yellowish-green fl. about 1½ in. diam.: berry bluish-black. Eu.

PARITI, PARITIUM: *Hibiscus.*

PARKERIACEÆ. Water-Fern Family. One genus of succulent aquatic ferns with two kinds of lvs., the fertile erect and pinnate, bearing the sporangia scattered or in longitudinal lines. Ceratopteris is grown in ponds.

PARKINSONIA. *Leguminosæ.* Trop. and warm-temp. trees or shrubs with bipinnate lvs., yellow or whitish fls. in racemes, and flattened leathery pods.

aculeata. Jerusalem-Thorn. Ratama. Tree to 30 ft. with spines about 1 in. long: lfts. having flattened twig-like stalks, the numerous small segms. deciduous: fls. yellow, fragrant, in loose axillary racemes: pods to 5 in. long, constricted between the seeds. Probably trop. Amer.—A good hedge plant.

Torreyana. Tree to 25 ft.: lfts. 2–3 pairs, ¼ in. long, glaucous: fls. bright yellow, in terminal racemes: pods to 3 in. long, constricted between seeds. Ariz., Tex.

PARMENTIERA. *Bignoniaceæ.* Trees, usually spiny, with lvs. of 3 lfts., large funnelform fls. solitary or clustered, the calyx split and spathe-like, and long cylindrical frs.; rarely planted in S. Fla.

cereifera. Candle-Tree. Lfts. obovate, to 2 in. long, entire or toothed: fls. white, to 3 in. long, with large brownish calyx: fls. hanging, to 4 ft. long, yellowish and resembling candles. Panama.

PARNASSIA. Grass-of-Parnassus. *Saxifragaceæ* (or *Parnassiaceæ*). Per. small herbs native in north temp. zone in low or moist places, with entire basal lvs. and 1 sessile lf. on the scape, and white fls. solitary at top of scape with greenish or yellowish veins. Useful for planting in damp situations, blooming in summer. Propagated by seeds or division.

asarifolia. To 20 in.: lvs. kidney-shaped, to 3 in. across, the st.-lf. orbicular and clasping, about middle of scape: fls. 1 in. across, the petals clawed. Va. to S. C.

californica (*P. palustris* var. *californica*). To 16 in.: lf. not clasping, tapering to base, to 1¾ in. long. Mts., Calif.

caroliniana. To 2 ft.: lvs. ovate to orbicular, to 2 in. long, often cordate at base, the st.-lf. ovate and clasping, below middle of scape: fls. 1½ in. across. N. B. to Va. and Ia.

fimbriata. To 1 ft.: lf. reniform or broad-cordate, to 1½ in. long: petals fringed on sides. Colo. and Calif. to Alaska.

palustris. To 1 ft.: lvs. ovate, to 1½ in. long, cordate at base, the st.-lf. ovate and clasping, below middle of scape: fls. to 1 in. across. N. Amer., Eu., Asia.

parviflora. To 1 ft.: lvs. oval, to 1 in. long, narrowed at base, the st.-lf. oval and clasping, about middle of scape: fls. about ½ in. across. N. Amer.

PAROCHETUS. *Leguminosæ.* One per. trailer from trop. Asia and E. Afr. **P. communis.** Shamrock-Pea. Blue Oxalis. Lfts. 3, marked with brown crescent at base: fls. papilionaceous, cobalt-blue with pink wings, solitary or 2–3 in the axils: pods 1 in. long.—Useful for rock-gardens or hanging-baskets. Propagated by seeds.

PARONYCHIA. Whitlow-Wort. Nail-Wort. *Caryophyllaceæ.* Small herbaceous tufted annuals and perennials with minute clustered fls. without petals, often hidden among silvery stipules or bracts: lvs. opposite, broad or narrow: mostly in the Medit. region but several native in U. S. Useful in the rock-garden. Of simple cult.; propagated by seed and the perennials also by division.

argentea. Prostrate per.: lvs. ovate to lanceolate, ciliate: fls. in dense clusters among the lvs., concealed by silvery bracts. Medit. region.

argyrocoma (*Anychia argyrocoma*). Erect or ascending per. to 8 in., making broad tufts or mats, covered with silvery scale-like hairs: lvs. linear, stipules silvery-white: fls. in forking cymes, concealed by the large and silvery bracts. Rocky places, Me. to Ga. and Tenn.

capitata: see *P. serpyllifolia.*

dichotoma. Tufted per. to 14 in., woody at base: lvs. awl-shaped, stipules silvery: fls. yellow, in loose cymes with ascending branches. Dry soil, Md. to Tex.

Kapela. Per. to 4 in.: lvs. oblong, bluish-green, ciliate: fls. in heads to ¾ in. across, concealed by silvery bracts. S. Eu.

Lindheimeri. Ann. or bien. to 8 in.: lvs. thread-like: fls. in loose cymes. Tex., New Mex.

serpyllifolia. Creeping rooting per.: lvs. obovate: fls. in dense heads borne in cymes. S. Eu.—Probably a var. of the species *P. capitata*, which is a per. to 6 in., sod-forming, with fls. in dense terminal silvery-white heads.

PAROSELA: *Dalea.*

PARROTIA. *Hamamelidaceæ.* One deciduous tree native in Persia, hardy N. and the foliage assuming brilliant autumnal colors. **P. persica.** To 15 ft.: lvs. oval, to 4 in. long, coarsely toothed above middle: fls. before lvs., in dense heads to ½ in. across surrounded by brown-tomentose bracts, without petals, the stamens drooping.—Propagated by seeds, layers and cuttings.

PARROTIOPSIS. *Hamamelidaceæ.* One Himalayan deciduous tree to 20 ft. **P. Jacquemontiana** (*Parrotia Jacquemontiana*). Lvs. nearly orbicular, to 3 in. long, toothed, turning pale yellow in autumn: fls. with the lvs., in dense heads to 2 in. across surrounded by large white bracts, without petals, the stamens erect.—Rather tender in the N. Propagated by seeds, layers, and cuttings of green wood under glass.

PARROTS-BILL: *Clianthus puniceus.* **-Feather:** *Myriophyllum proserpinacoides.*

PARSLEY: *Petroselinum hortense.*

PARSNIP: *Pastinaca.* **Cow-:** *Heracleum.*

PARSONSIA: *Cuphea.*

PARTED: cleft or cut not quite to the base, as a leaf or petal.

PARTHENIUM. *Compositæ.* Per. herbs or shrubs, sometimes ann., with alternate lvs. and small heads of white or yellow ray-and-disk-fls. borne in corymbs and panicles; pappus of awns or none; native N. Amer. to N. S. Amer.

The guayule is grown in southwestern United States for the rubber obtained from the stems and is now of commercial importance. The plants are set out late in March in rows 2–3 feet apart. Propagated by seeds.

argentatum. Guayule. Shrub to 3 ft., much branched: lvs. lanceolate to ovate-lanceolate, to 2 in. long, silvery-pubescent: heads ¼ in. across. Mex., Tex.

PARTHENOCISSUS (*Psedera*). *Vitaceæ.* Shrubs climbing by tendrils mostly with disk-like tips, having alternate lobed or digitately compound lvs., small greenish fls. in cymes, parts of the fl. in 5's and falling separately (see Vitis), and fr. a black berry.

These vines are grown as covering for walls, fences and arbors and allowed to grow on trees. They thrive in any good soil. Propagated by seeds, cuttings of hard and green wood, and by layers.

Henryana (*Ampelopsis Henryana*). Young branchlets 4-angled: lvs. of 5 ovate to obovate lfts. to 2½ in. long, toothed above middle, marked with white above, purplish beneath. China.

heptaphylla (*Ampelopsis heptaphylla*). Lvs. of mostly 7 oblong-lanceolate lfts. to 2½ in. long, coarsely toothed. Tex.

himalayana. Allied to *P. tricuspidata:* lfts. 3, obovate to ovate, glaucous underneath. Himalayas; adaptable only far S.

hirsuta: *P. quinquefolia* var.

lætevirens. Lvs. of 5 obovate lfts. to 4 in. long, coarsely toothed, yellow-green, glabrous except perhaps on veins underneath. China.

quinquefolia (*Ampelopsis quinquefolia* and *hederacea*). Virginia Creeper. American Ivy. Lvs. of 5 elliptic-ovate coarsely toothed stalked lfts. to 6 in. long, paler beneath. New England to Fla. and Tex. Var. **Engelmannii** (*Ampelopsis Engelmannii*). Lfts. smaller. Var. **hirsuta** (*P.* and *Ampelopsis hirsuta*). Lvs. pubescent beneath. Var. **murorum.** Tendrils short and numerous. Var. **Saint-Paulii** (*Ampelopsis Saint-Paulii*). Branchlets often with aerial rootlets; lfts. pubescent beneath. Var. **vitacea** (*P.* and *Ampelopsis vitacea*). Tendrils mainly without disks and not clinging well; lfts. deeply cut in one form.—In its many forms, the Virginia creeper is one of the hardiest and most adaptable of climbers; sometimes called Five-leaved Ivy and Woodbine.

Thomsoni (*Ampelopsis Thomsoni*). Lvs. of 5 elliptic toothed lfts. to 3 in. long, purplish when young. China, Himalayas.

tricuspidata (*Ampelopsis tricuspidata*). Japanese or Boston Ivy. Lvs. variable, ovate to orbicular, to 8 in. across, 3-lobed or 3-parted, shining above. Japan, China. Var. **Lowii** (*Ampelopsis Lowii*). Lvs. to 1½ in. long, purplish when young. Var. **purpurea.** Lvs. dark purple. Var. **Veitchii** (*Ampelopsis Veitchii*). Young lvs. purple, smaller.

vitacea: *P. quinquefolia* var.

PARTRIDGE-BERRY: *Mitchella repens.*

PASANIA: *Lithocarpus.*

PASPALUM. *Gramineæ.* Per. or ann. grasses of temp. and warm regions of the world, sometimes grown for ornament: spikelets in one-sided racemes. See *Grasses*

dilatatum. Per. to 6 ft.: lvs. to 1 ft. long and ½ in. wide: racemes to 5 in. long, in panicles of 3–8. Argentina; nat. in S. U. S.

racemosum. Ann. with decumbent sts. to 3 ft. long: lvs. to 5 in. long and 1 in. wide: racemes to 1 in. long, numerous, in panicles to 6 in. long. Colombia to Peru.—Cult. as *P. elegans* and *P. stoloniferum.*

PASQUE-FLOWER: *Anemone Pulsatilla.*

PASSIFLORA. Passion-Flower. *Passifloraceæ.* Vines climbing by tendrils, with alternate entire or lobed lvs., solitary or racemose odd and often very showy fls. with stamens united in tube and fr. a many-seeded berry; some of them have edible frs. and others are grown as ornamentals.

Passifloras are hardy only in the southernmost United States but are sometimes grown under glass for the striking bloom. Propagated by seeds and cuttings. *P. edulis* and *P. quadrangularis* are the species mostly grown for the edible fruit.

alata. Sts. slightly winged: lvs. entire: fls. fragrant, to 5 in. across, white, red inside, the crown red, purple and white: fr. yellow, to 5 in. long, edible. Trop. Amer.

alato-cærulea (*P. Pfordtii*). Hybrid between *P. alata* and *P. cærulea:* lvs. 3-lobed: fls. fragrant, 4 in. across, white, pink inside, the crown purple, blue and white.

atropurpurea. Hybrid between *P. racemosa* and *P. Raddiana:* fls. 3 in. across, dark red, the crown violet spotted with white.

Banksii. Lvs. with 3 broad lobes: fls. pale at first but becoming scarlet. Australia.

cærulea. Lvs. with 5 lanceolate lobes: fls. to 4 in. across, pale pink, the crown white and purple: fr. yellow, 1½ in. long. Brazil, and grown under glass. Var. **grandiflora** has larger fls. and "Constance Elliott" white fls.

coccinea. Lvs. ovate, not lobed, coarsely toothed: fls. scarlet with orange crown. S. Amer.

Colvillei. Hybrid between *P. incarnata* and *P. cærulea:* lvs. with 3–5 deep toothed lobes: fls. 3½ in. across, white spotted with red-brown, the crown purple, white and blue.

edulis. Purple Granadilla. Lvs. with 3 deep toothed lobes: fls. 2 in. across, white with white and purple crown: fr. deep purple, to 3 in. long, edible. Brazil.

exoniensis. Hybrid between *P. Van Volxemii* and *P. mollissima:* lvs. deeply 3-lobed, pubescent beneath: fls. to 5 in. across, brick-red, rose-pink inside, with tube 2½ in. long.

gracilis. Lvs. with 3 shallow lobes: fls. pale green or white, apetalous, about 1 in. across. Brazil.

ignea: *P. manicata.*

incarnata. Wild P. Maypop. Lvs. with 3 deep toothed lobes: fls. to 2 in. across, white with purple or pink crown: fr. yellow, to 2 in. long, edible. Va. to Fla. and Tex.

Jamesonii (*Tacsonia Jamesonii*). Lvs. 3-lobed: fls. bright rose or coral-red, the calyx-tube about 4 in. long. Peru.—Some of the material cult. under this name is *P. tomentosa.*

lanata (*Tacsonia lanata*). Lvs. entire, tomentose beneath: fls. white, with tube 2½ in. long. Andes.

laurifolia. Yellow Granadilla. Water-Lemon. Jamaica-Honeysuckle. Lvs. entire: fls. to 4 in. across, white spotted with red, the crown violet and white: fr. yellow, to 3 in. long, edible. Trop. Amer.

ligularis. Sweet Granadilla. Lvs. entire: fls. to 3 in. across, greenish with white and purple crown: fr. brown or purplish, 3 in. long, edible. Trop. Amer.

macrocarpa: *P. quadrangularis.*

maliformis. Lvs. entire: fls. fragrant, to 5 in. across, white with red, violet and white crown: fr. yellowish-green, 2 in. across, edible. Trop. Amer.

manicata (*P. ignea. Tacsonia manicata*). Lvs. with 3 ovate toothed lobes: fls. to 4 in. across, bright scarlet with blue crown, the calyx-tube 1½ in. long: fr. yellowish-green. Colombia, Ecuador, Peru.

militaris. Lvs. with 3 deep toothed lobes: fls. to 5 in. across, deep crimson with purple crown. Hybrid.

mixta (*Tacsonia mixta*). Lvs. with 3 deep toothed lobes: fls. rose-pink, to 4 in. across, the green calyx-tube to 5 in. long. Andes.

mollissima (*Tacsonia mollissima*). Lvs. with 3 deep toothed lobes, very pubescent beneath: fls. to 3 in. across, rose, the calyx-tube to 5 in. long: fr. yellow. Andes.

Pfordtii: *P. alato-cærulea.*

princeps: *P. racemosa.*

quadrangularis (*P. macrocarpa*). Giant Granadilla. Sts. winged: lvs. entire: fls. fragrant, 3 in. across, white with purple and white crown: fr. greenish-yellow, to 10 in. long, edible. Trop. Amer. Var. **variegata** has foliage blotched yellow.

racemosa (*P. princeps*). Lvs. deeply 3-lobed, margins entire: fls. to 4 in. across, deep red with purple and white crown: fr. greenish-yellow, 2 in. long. Brazil.

Raddiana. Lvs. 3-lobed, slightly toothed, purplish beneath: fls. crimson, the crown dark purple with white filaments inside. Brazil.

tetrandra: *Tetrapathæa tetrandra.*

tomentosa (*Tacsonia tomentosa*). Lvs. 3-lobed, tomentose beneath: fls. with pubescent tube to 3½ in. long. Peru.

trifasciata. Lvs. 3-lobed, banded with purple along midribs: fls. small, yellowish, fragrant. Brazil.

Van-Volxemii (*Tacsonia Van-Volxemii*). Lvs. with 3 lanceolate toothed lobes: fls. to 5 in. across, bright red; calyx-tube to 1½ in. long: fr. edible. Colombia.

violacea. Lvs. 3-lobed: fls. to 4 in. across, violet with violet and white crown. Brazil.

PASSIFLORACEÆ. Passion-Flower Family. About 18 genera of woody vines or sometimes erect herbs, most abundant in S. Amer., characterized by alternate simple or lobed lvs., simple tendrils, regular mostly bisexual fls. with 3–5 sepals and separate petals or without petals, usually with a conspicuous often showily fringed crown in the center, and fr. a berry or caps. Passiflora is grown for ornament and for the edible fruits, also Tetrapathæa.

PASSION-FLOWER: *Passiflora.*

PASTINACA. Parsnip. *Umbelliferæ.* Mostly bien. thick-rooted herbs with pinnately compound lvs., yellow or red fls. in compound umbels, and flattened frs.; grown for the edible root.

Parsnips should be grown in deep mellow soil so that the roots may develop straight and unbranched. Seeds may be sown in spring in rows 16–18 inches apart and the seedlings thinned to 5–6 inches in the row. If the ground becomes crusted or baked before the seeds germinate, it should be broken with a rake. Parsnips may be dug in autumn and stored in a cellar, or left in the ground till spring. They require the entire season in which to grow.

sativa. Cultivated P. To 5 ft., with grooved hollow st. and roots to 20 in. long: lvs. with 7–9 ovate toothed or lobed lfts.: fls. greenish-yellow. Eu.—The wild form, var. **sylvestris**, is nat. in N. Amer.

PATA-VACA: *Bauhinia mexicana.*

PAULLINIA. *Sapindaceæ.* Trop. climbing shrubs with alternate compound lvs., small irregular fls. in axillary racemes, and somewhat fleshy capsular frs.; one species is grown in the greenhouse as a foliage plant. The tops should be pinched off to induce stocky growth. Propagated by cuttings in early spring.

thalictrifolia. Tendril-bearing: lvs. fern-like, three times pinnate into 3 small lfts., of bronze tint when young: fls. pinkish: fr. 1 in. long, 3-winged. Brazil.

PAULOWNIA. *Scrophulariaceæ.* Chinese deciduous trees grown for their large attractive opposite catalpa-like lvs. and showy panicles of violet, or sometimes nearly white, tubular fls. with 5 spreading lobes: fr. a large caps. with winged seeds.

Paulownias are tender in far North but are root hardy north of their proper region and in the spring send up strong new shoots and make very large leaves. They thrive best in a light deep loam and northward in a sheltered position. Propagated by seeds sown in the spring or by root-cuttings, and in greenhouses from greenwood cuttings, also from the leaves, taken when unfolding and about 1 inch long.

Fortunei. Tree to 20 ft.: lvs. ovate or ovate-oblong, to 10 in. long, densely tomentose beneath: fls. before lvs., white spotted inside with purple, to 4 in. long. China.—Grown in Calif.

imperialis: *P. tomentosa.*

tomentosa (*P. imperialis*). Pubescent tree to 40 ft., much like catalpa in habit: lvs. broad-ovate, to 1 ft. and more long, entire or 3-lobed, tomentose beneath: fls. 2 in. or more long, pale violet, darker spotted inside, fragrant, in many-fld. panicles to 1 ft. long. Escaped in the U. S.; hardy in the East to about the latitude of N. Y. City or somewhat farther, and along the Ohio River. Var. **lanata** is yellow-tomentose beneath. Var. **pallida** has pale fls.

PAUROTIS ANDROSANA: *Acœlorraphe Wrightii.*

PAVIA: *Æsculus.*

PAVONIA (*Malache*). *Malvaceæ.* Trop. and warm temp. herbs and shrubs in Old and New Worlds, with alternate often angled or lobed lvs., yellow, pink or purple fls. solitary or clustered and 5 carpels separating from axis at maturity; sometimes grown under glass N., or in the open in warm climates. Propagated by cuttings in spring or early summer, or by seeds.

flava: *P. sepium.*

hastata. To 6 ft., shrubby: lvs. toothed, halberd-shaped: fls. solitary, pale red with dark spot at base, to 1 in. long. S. Amer.; nat. in S. U. S.

multiflora. Lvs. narrowly oblong, toothed: fls. in terminal clusters, purple, to 1½ in. long, the staminal column exserted. Brazil.

præmorsa. Shrub: lvs. broad-ovate, toothed: fls. yellow with dark center, solitary. S. Afr.

sepium (*P. flava*). To 6 ft., shrubby: lvs. oblong-ovate, coarsely toothed: fls. about ½ in. long, in few-fld. racemes. S. Amer.

spinifex. Shrub to 20 ft.: lvs. ovate, toothed: fls. solitary, yellow, 1 in. long. Trop. Amer.; nat. in S. U. S.

PAWPAW: *Carica Papaya;* also *Asimina triloba,* mostly spelled *papaw.*

PEA. The garden and field pea is a cool-season hardy annual, tendril-climbing and needing support, or the early varieties dwarf ("bush") and allowed to lop. It occupies the land only part of the season. Peas are grown for the edible green seeds, and one race for the edible pod with the seeds intact after the way of string beans but this sort is little known in North America. See *Pisum.*

Garden peas are "smooth" and "wrinkled." The smooth kinds are usually planted somewhat earlier and for that reason mature earlier, but they are inferior to the wrinkled kinds in quality: they should be planted only in a small way in the home garden, but they are the usual field kinds. The dwarf and half-dwarf varieties are likely to be grown to the exclusion of the tall or running kinds but the latter usually give best results. The trouble of providing support is largely overcome if one procures chicken-wire 2½ or 3 feet wide and stout stakes; as soon as the crop is off, the wire is rolled up, the stakes pulled and allowed to dry in the sun, and the material is then properly stored, being used over and over again for years. Plant double rows of the tall varieties: that is, two rows from 4 to 8 inches apart, with the wire between, the double rows being 2 to 3 feet apart or wide enough for convenient tillage. The dwarf varieties may be planted four rows in a block, the rows only 6 or 8 inches apart. The peas on the two center rows may be picked from the outside. Leave a space between the blocks sufficient for tillage. At the time of the first planting only the smooth varieties should be sown. A succession should be sown that will come to maturity one after the other, extending the season six or eight weeks. If a further supply is wanted the early quick-maturing varieties may be sown in August, although peas are not an autumn crop. In the hot weather of midsummer they do not thrive.

One quart of seed will plant about 100 feet of drill or less in the wrinkled and large-seeded sorts. It is a common mistake to leave peas too thick in the row; plants should be thinned to 3 or 4 inches at least for the tall kinds. The first sowing of smooth peas is usually the initial planting operation in the garden, as they may be put in the ground before freezing weather is past; plant the early kinds 3 to 4 inches deep.

As a field crop, peas may be sown in rows far enough apart to admit of horse-hoeing, but usually they are broadcast or planted with a grain drill. For sale as green peas, the pods are picked by hand, but for canning the crop is harvested with a mowing-machine and hay-rake. The canning crop is hauled to the factory as gathered and is there threshed; the straw has value as manure and as sheep feed.

Pea louse is often a serious pest, particularly in broadcast fields where the insect spreads readily from plant to plant. In rows the louse or aphis can be controlled by spraying, as with Black Leaf 40 and nicotine preparations. The lice may be brushed from canning fields by a machine devised for the purpose. The pea weevil infests ripe peas in storage, where they may be killed by fumigation with bisulfide of carbon; but peas that have been injured by weevil should not be planted for they produce weak plants.

PEA: see *Lathyrus.* **Asparagus-:** *Psophocarpus tetragonolobus.* **Butterfly-:** *Centrosema, Clitoria.* **Chick-:** *Cicer arietinum.* **Glory-:** *Clianthus Dampieri.* **Pigeon-:** *Cajanus Cajan.* **Rosary-:** *Abrus precatorius.* **Scurfy-:** *Psoralea.* **Shamrock-:** *Parochetus communis.* **-Shrub:** *Caragana.* **-Tree:** *Caragana.* **Winged-:** *Lotus tetragonolobus.*

PEACH (*Prunus Persica*). In some of its forms the peach can be grown in nearly all parts of the United States and southern Ontario where winter temperatures do not fall beyond 12° to 15° below zero and late spring frosts are not common. Although under most favorable conditions dormant peach blossom-buds may withstand a temperature of 20° below zero, ordinarily 10° below is critical and lower temperatures may cause damage. Temperatures of 15° to 25° below zero may seriously injure the sapwood or kill the tree outright. Commercial peach-growing is, therefore, confined to the southern and middle states, and those parts of the northern states that have the protection of bodies of water as for example the fruit districts along the Great Lakes and some of the larger inland lakes. Outside these regions, peach-growing is too uncertain to be commercially profitable, but may be undertaken in home plantings where occasional crop failure is of no great importance. Subtropical regions are too warm for successful peach-growing. The crop is of great importance in California.

Individual peach trees may bear until twenty and more years old, but as an orchard crop peaches are short-lived, and one should be satisfied with three or four full crops from each tree. They bear young, usually a partial crop the third year. If a crop may be had every year or two until the trees are nine to twelve years old, they will have well repaid the effort of cultivation. Commercial growers have successive orchards coming on, but in the home garden young trees may be set every four or five years to replace older ones, thus having trees at a bearing age at all times on a small place. Peach trees are set when one-year old, that is, one season's growth from the bud. Trees should be set 18 to 20 feet apart each way in spring or autumn, the former being the better time in the North. In regions where the trees attain large size, planting should be as much as 24 feet apart either way.

Although peaches may be grown with fair success on practically any good agricultural soil that is well drained and reasonably warm, the fruit attains its best development in color and quality on good sands, sandy loams or the lighter clay loams. In some regions, with abundant fertilizer, good commercial crops are grown in almost pure sand. Heavy or very fertile lands which prolong the growing season should be avoided in the North as late growth does not become sufficiently hardened to withstand the winter.

Propagation of the peach is by means of seeds, which are procured largely from the naturalized wild trees of the Carolinas and Tennessee. The pits are planted in the nursery row in late summer, or they may be stratified or piled and sown in spring; in either case germination does not take place until the spring following the ripening of the seed. The first-year seedlings are budded to the desired variety, in June in the southern states and in late August or September in the North. The buds inserted in late summer or autumn remain dormant until the following spring, when the stock (or young tree) is cut off just above the bud; this bud is forced into growth, and all other sprouts from the stock are pulled off. The age of the tree is reckoned from the bud, but of course the root is one year older. In June-budded trees in the South, the bud grows the same year in which it is inserted and the resulting tree is ready for planting that autumn. For heavy lands, peaches are sometimes budded on stocks of St. Julien or Damson plum.

Tillage and fertilizer are important. Although it is sometimes possible to grow peaches for home use without cultivation, by mulching with manure, fertilizing heavily, or planting the trees in the poultry yard, the universal practice in commercial orchards is to till thoroughly and turn under cover-crops. The land is plowed or disked in early spring and then tilled frequently enough to kill all weeds until July or August or until the peach crop is well along. A cover-crop of weeds or sowed crop, such as buckwheat, rape, clover or cowpeas, is allowed to grow. On light sandy soils a complete fertilizer is frequently added, although usually nitrate of soda is the most effective element. The nitrate may be applied at the rate of 2 to 4 pounds a tree, when the buds start growth. Nitrate should be applied with caution as an overdose will lower the color of the fruit and prolong growth too late in the season. Manure may be used to advantage in many cases.

Pruning at the time of setting is the common practice with peach-growers. The trees are headed to the desired height, usually 18 to 24 inches, and all but the three or four branches wanted for the head are removed and these are cut back to stubs 2 to 3 inches long. After the first season's growth the shoots not desired for the permanent head are removed. From this time until the first crops are borne, the tree should be pruned little except to keep it in shape and the head somewhat open. Mature trees must be heavily pruned to maintain vigor of growth of the fruiting wood, to keep the tree low so that the fruit can be harvested from the ground or a six-foot stepladder, and to open up the center of the tree. All this is accomplished by heading back the most vigorous growth to side branches and thinning out where necessary. The best time for pruning peach trees is in the late winter or early spring before the buds start.

Peaches are harvested when full sized and well colored, but still firm. The time of picking is very important and requires experience to determine it with nicety. Care must be taken not to tear the flesh about the stem. In its fourth or fifth year a well-grown tree may yield ½ to 1 bushel of fruit and when in full bearing 3 to 4 bushels are not exceptional. On the average, however, 150 to 250 bushels to the acre are all that can be expected. The yield of peach trees is not dependent on cross-pollination, except in the variety J. H. Hale.

Marketing and storage have changed in recent years. Roadside and local markets now absorb much of the peach crop. The commercial crop is shipped in various types of containers, among the most common being the Georgia carrier of the south Atlantic states, hampers of various sizes and the standard bushel basket. Because of the perishable nature of the fruit it is usually precooled and shipped in iced cars if the distance is great. Firm fruit in prime condition can be held in cold storage for a week to ten days at 32° F., after which loss of quality is rapid.

Varieties of peaches are many, with regional adaptations. The commercial grower should choose varieties suited to the particular market. The following varieties, listed in order of ripening, give a succession for either home or commercial use.

Varieties with hardy fruit-buds adapted to growing at the northern limits of peach culture: Greensboro, Rochester Triumph, Snow, Crosby, Gold Drop, Hills Chili, Iron Mountain.

Varieties for fruit sections of New England, New York, and Michigan: Carman, St. John, Rochester, Niagara, Champion, Belle, South Haven, J. H. Hale, Elberta, Smock.

Varieties for the Atlantic coast not including Florida: Mayflower, Greensboro, Carman, Hiley, Belle, J. H. Hale, Elberta, Late Crawford.

Varieties for the Middle West: Greensboro, Carman, Fitzgerald, Champion, Belle, Elberta, Crosby, Smock, Salwey.

Varieties grown on the Pacific coast, not including canners and driers: Mayflower, Alexander, Triumph, St. John, Hale's Early, Early Crawford, Early Elberta, Elberta, J. H. Hale, Salwey, Decker.

Varieties for southern Florida and other subtropical regions: Jewell, Suber, Waldo, Angel, Florida Gem, Honey, Imperial, Dorothy, Estella.

Pests and diseases are to be met promptly. The spraying of the commercial orchard should be carefully planned to meet local conditions. In most cases a satisfactory program for home planting consists of two sprays. The first spray should be applied in autumn after the leaves are off or early in the spring before the buds start, using lime-sulfur 1–15 or an oil spray for the control of scale, leaf-curl and brown-rot; the second spray is applied when the "shucks" or calyx-rings are falling from the fruit, using a lime-sulfur mixture of 4 pounds slaked lime, 8 pounds fine sulfur, 50 gallons water, with ½ pound of Kayso or other calcium caseinate, and 1 pound dry arsenate of lead added. This is to control curculio and brown-rot.

The peach borer, one of the worst pests in many regions, can be controlled by the use of paradichlorobenzine. All gum is removed from the base of the tree and the ground made level for a space of about 1 foot. The dry white powder is then spread on the ground in a narrow ring about 2 inches from the base of the tree. The base of the tree is then mounded up with finely pulverized earth to a height of about 2 inches above the highest visible borer injury and the surface of the mound packed with a shovel. This mound should be left undisturbed for three weeks and then torn down. One ounce of powder for a tree six years old, ½ ounce for a three-to five-year tree, ¼–⅜ ounce for a one- to two-year tree is sufficient. An excess may cause serious injury. Applications should be made in autumn, about September 1 in a region like New Jersey, when the soil temperatures are about 55–70° F. Borers may also be dug out in the way described for the apple-tree borer.

PEACOCK-FLOWER: *Delonix regia.* **Flower-Fence:** *Adenanthera pavonina.*

PEANUT: *Arachis hypogæa.*

PEAR. The pears known in North America are of three botanical groups: (1) The European pear, *Pyrus communis*, comprising all the old standard varieties. (2) The Asian or oriental pear, *P. pyrifolia* (*P. serotina*), native in China, characterized by the absence of calyx on the fruit, a very gritty hard flesh and long-keeping quality, mostly an apple-shaped fruit, and sharply serrate long-pointed leaves; the Sand pear belongs here, but the species is not much grown in America. (3) The Eurasian race, hybrid between the two, represented principally by Kieffer and Leconte. The Snow pear, *Pyrus nivalis*, is grown in Europe for the making of cider or perry but is known in America only in botanical collections.

No home fruit plantation is complete without trees of various kinds of pears, ripening from early August till winter. The late varieties are generally good keepers, and extend the season into February, thus supplying fruit for six or seven months. The pear is also a good commercial fruit although perhaps not maintaining its former importance in many of the fruit regions. Compared with the apple the pear is much more restricted in its geography. It cannot endure the low temperatures of many parts of the northern states nor the humid heat of the South, thriving only in those favored regions that have a fairly equable climate. Commercially, therefore, plantings of the European type of pear are largely confined to the fruit districts of New England, about the Great Lakes and on the Pacific coast. In home plantings, by the selection of cold-resistant varieties, the range can be extended somewhat farther north and by blight-resistant varieties, particularly those derived from the oriental or Asian pear, into the southern states.

Soils for the pear should be of the strong or heavy types. It thrives on the heavier sandy loams or clay loams, which have good humus content and moisture-holding capacity. Good drainage and a porous subsoil are essential for its best development. On the average the European pear is adapted to heavier soils than the apple. The Kieffer and other oriental pears, however, thrive better on rather light soil.

Propagation of the pear is by seeds, which are imported from France, or from Japan if the oriental stock is desired. Commonly, however, nurserymen import the seedling stocks from France. The desired varieties are budded or grafted on one-year seedling stocks as with the apple, shield-budding being the usual method. Dwarf pears are propagated by budding on French-grown Angers quince cuttings. Some varieties do not grow well on quince, but must be double-worked by budding a compatible variety, like Angouleme, directly on the quince stock and after the cion has grown a year or two grafting the desired variety on the Angouleme as an intermediate stock. As some varieties of pear grow to perfection on quince, the dwarf tree is peculiarly adapted to planting on small home grounds, and is often used as a boundary plant, or to serve the purpose of a screen. These dwarf trees should be set deep—4 to 6 inches below the union—to prevent the stock from growing. Dwarf trees may be set as near together as 10 to 16 feet, while the standard or tall-growing pears should be set farther apart. Trees are planted when two or three years old. Dwarfs are kept within bounds by thorough and systematic pruning and heading-in.

In orchards, one- or two-year-old nursery trees are planted very early in the spring in the northern states. In milder climates, fall planting may be successful. Planting distances are 20 × 25 or 25 × 25 for standards (not dwarfs). To provide satisfactory pollination it is advisable to plant at least two in contiguous rows or alternating in the rows.

Not more than three to four rows of one variety should be planted together.

Tillage and fertilizer are much the same as for other fruits. Either tillage and cover-crops, or sod culture, are practiced as with the apple. Mulching trees with grass or straw in the home orchard is often advisable. Trees in sod require fertilization with manure or nitrate. Great care must be exercised not to force the tree into very soft growth and thus render it susceptable to fire-blight infection.

Pruning is similar to that described for the apple except that more scaffold limbs can be left on the young pear tree. As the trees mature they should be thinned out by removing crossing or crowded limbs and, in case the head becomes spurry, by cutting out many of the smaller branches. Kieffer and other oriental pears are cut back much more severely than varieties of the European pear. Pruning may be undertaken at any time when the trees are dormant, ordinarily in late winter or early spring.

The fruit is always hand-picked when mature but still firm. The fruit is raised and the stem separates from the twig; it should not be pulled off. Pears should not be tree-ripened even for home use. The yields vary with the variety, but under good conditions 200–400 bushels to the acre may be expected. In the East, pears go on the general market in bushels and hampers and to some extent in barrels. On the Pacific coast the box is the standard package. Local markets and canneries absorb much of the crop in some regions.

The cold storage of pears is not as well understood as of the apple. Many varieties are perishable and should not be stored, or for a short time only. Bartlett, if picked while still very firm, can be held for three months at 30° F., although under most conditions a month or six weeks is the commercial limit of storage. Most varieties should be put into storage as soon as possible after picking. The Bosc, however, is an exception and should be ripened at 50° F. for ten days before going into the cold. Varieties like Anjou, Winter Nelis, and Lawrence, may be held until February in cold storage. In home storage, the fruit should be kept as cool as possible without freezing, in a dark place.

The question of varieties is very important inasmuch as there is great variation in regional adaptation and resistance to disease. In the following lists the varieties are given in order of ripening. Commercial varieties are starred:

Varieties of more than average hardiness adapted to growing in the colder parts of the pear regions: Tyson, *Clapp, *Seckel, Flemish Beauty, *Anjou, Lawrence.

Varieties adapted to milder fruit sections, such as the fruit districts of New England, New York, Ohio and Michigan: Tyson, *Clapp, *Bartlett, Fred Clapp, *Seckel, Worden Seckel, Angouleme, *Bosc, *Clairgeau, *Anjou, Dana Hovey, *Kieffer, Lawrence, Winter Nelis.

Varieties for the states south of New York: Kieffer, LeConte, Garber, Pineapple.

Varieties for the Pacific coast: *Bartlett, *Comice, Flemish Beauty, *Bosc, *Anjou, *Winter Nelis.

Varieties resistant to fire-blight: Tyson, Seckel, Fred Clapp, Angouleme, Kieffer, Anjou.

Insects and diseases play an important part in pear culture. Of those common to both apple and pear the codlin-moth and borers are important and may be controlled as described under the former. Fire-blight is the most serious disease, becoming the limiting factor to pear-growing in the southern part of the pear regions. It is caused by bacteria which gain entrance through flowers and insect punctures and cause the young growth and fruit to blacken and die. Frequently trees of susceptible varieties are killed outright. It is impossible to control the disease with sprays. It can sometimes be kept in check by cutting out the diseased branches as soon as they are observed, making the cuts a foot or more below the point where the tissue is killed. The cut stub should be disinfected with a mixture of cyanide of mercury 1 part, bichloride of mercury 1 part, and water 500 parts. Cankers on the trunk and limbs should have the bark removed from the diseased area and at least ½ inch beyond and the wound disinfected. In some regions pear psylla is a very troublesome pest as are also the pear midge and the pear thrip. The control of these insects is a complicated and difficult matter which, in the commercial orchard, requires expert advice. For the home orchard about the only spray that is practicable is the calyx application for codlin-moth control as for apple.

PEAR, ALLIGATOR-: *Persea americana.* **Balsam-**: *Momordica Charantia.* **Prickly-**: *Opuntia.* **Vegetable-**: see *Chayote.*

PEARL-BUSH: *Exochorda.* **-Fruit**: *Margyricarpus setosus.*

PEARLWORT: *Sagina.*

PECAN. One of the hickory-nuts, *Carya* (or *Hicora*) *Pecan.* In the United States, the species is indigenous throughout most of the valley of the Mississippi and its principal tributaries as far north as Iowa, especially on the lowlands along the rivers and creek bottoms. Farther west, it is found along most of the important streams in Texas and Oklahoma. In Mexico, the pecan is native over areas in the northern and central parts. The cultural range of the pecan, as is usual with most fruits and nuts, is much larger than its native habitat. Pecans have been planted successfully from the Atlantic coast to the western part of Iowa, Oklahoma, and west Texas, from the forty-third parallel on the north to the Gulf on the south. In addition, successful trial plantings have been made in Arizona and in the Pacific states, especially California.

In Texas, Oklahoma, Arkansas, and Louisiana the native pecan has become of considerable commercial importance as a nut-producing tree. It is estimated that in Texas alone there are between 50,000,000 and 75,000,000 native seedling trees, which produced, in 1919, over 16,000,000 pounds of nuts. Very little attempt has been made to improve these native groves. They usually stand in pasture land where the trees have to contend with animals and plants of every description, as well as against the elements. In many places, the native pecan trees, even when all other timber is destroyed, grow two or three times too thick for best results. These groves should be given a better chance. The first step in their improvement is to remove all underbrush and trees of other species. The pecan trees should be examined carefully in a good bearing year and all barren specimens and those producing unprofitable crops of nuts removed, in case they are close enough to interfere with a good producing tree. If they are standing by themselves and are of suitable size, they may be worked over to an improved variety.

Propagation of the pecan is more difficult than of most fruit-trees. It is not feasible to root pecans from cuttings, and seedlings fail to come true to the parent type. The propagator has, therefore, to resort to budding or grafting to perpetuate desirable varieties. The pecan can be budded or grafted on almost any species of hickory, but its own roots are more compatible as stock. Pecan nuts may be planted in the fall, soon after they are harvested, or they may be stratified and held until late winter or early spring. The rows are commonly laid out 4 to 6 feet apart, the nuts dropped 6 to 8 inches apart in the row and covered 1½ to 2 inches deep. As the young seedlings push through the soil in the spring they should be cultivated in the same way as annual crops, such as cotton or corn. These young seedlings will make 8 to 12 inches of growth the first season and the stronger ones should be ready to bud or graft in the second season. The importance of top-working as a means of changing the seedling pecan trees into more desirable varieties can scarcely be over-estimated. Some of the objects accomplished by this process are: the changing of non-productive and unprofitable trees into desirable varieties; the transforming of unsatisfactory varieties, those unsuited to a certain region or susceptible to diseases or insect pests, into more suitable kinds; the hastening into bearing of new or untried varieties. The top-working of pecan trees and the working of stock in the nursery is by whip-graft, bark-graft, patch-and chip-budding.

The pecan orchard should be located on deep fertile land, or capable of being made fertile, whether it is on upland or bottom. The pecan is a deep-rooted and long-lived tree. In planting the orchard it should be remembered that the tree is to draw its nourishment from the same area over a long period of time, perhaps eighty to one hundred years. The pecan blossoms late in the spring and, therefore, it is not often affected by frost and freezes like most other orchard trees. It is thus unnecessary to use the same precautions in selecting elevated land in order to give it good atmospheric drainage as in the planting of peaches, plums, and the like. The soil for the pecan orchard should be prepared well in advance of setting out the trees. Staple crops should have been grown on the land for at least two or three years before being planted to pecans. It is a serious mistake to plant a pecan orchard on land that still contains virgin timber or that is full of stumps or sprouts. The distance allowed between pecan trees varies greatly, depending on whether the soil is sandy, upland, or rich alluvial bottom land. At least 46 feet 8 inches should be allowed on upland and from 60 to 72 feet on alluvial soil. The mistake is often made of spacing the trees too closely.

Cultivation is of two general methods until the trees occupy all the land: clean cultivation; planting crops between the trees. Pecan trees should be thoroughly cultivated, regardless of age. In cropping the orchard, plenty of space should be allowed either side the tree row to permit thorough tillage to be continued after the crop matures or has been harvested. The space allowed on either side of the row should be 5 to 6 feet to start and increased gradually as the trees develop. Orchards may be given clean cultivation from the time the young trees are planted. However, this is costly when it has to be continued for twelve years before the trees begin to produce in paying quantities. Cover-crops, in addition to their many other beneficial effects on the soil, aid materially in preventing washing and the loss of plant-food by leaching. They add humus to the soil and, in the case of legumes, increase the nitrogen content.

The cracking of pecans on a commercial scale, to obtain the common market "meats," has developed rapidly in recent years. In operating one of the most common types of automatic power-driven machines, the nuts are poured into a hopper through which rotates an endless chain belt with cups or projections just large enough to carry one nut over into a slot of the machine. A piston-like rod working automatically in the slot brings pressure on the ends of the nut, which cracks it. The nut is then released into a receptable below with a minimum of broken kernels. Soaking the pecans before they are cracked makes the shell brittle so that it breaks in numerous places and renders the meat tough so it will not crumble. This is accomplished by placing the pecans in a large tank, with sufficient water to cover them, and allowing them to soak five or six hours. The water is then drained off, the top of the tank closed, and the pecans allowed to remain in this damp atmosphere from three to five days before cracking. When the pecans have been thoroughly soaked, it is necessary to dry out the excess moisture from the kernels before they are packed. This can be best accomplished by placing them in trays 24 inches wide, 36 inches long, and 4 inches deep. The bottom of the tray is covered with ordinary screen wire. Each tray holds 30 to 40 pounds of pecans. At night an electric fan is set so as to send a current of air over the pecans. When the weather is clear, the meats dry out thoroughly by morning. If the atmosphere is moist, an electric heater is set back of the fan to help take up the excess moisture. The meats are thus ready for packing the second day after the nuts are cracked.

The pecan does not deteriorate rapidly after harvesting. However, if held indefinitely under ordinary conditions it eventually becomes inedible on account of the rancidity of its fat or oil content. When large quantities of pecans are to be held for the greater part of the year, adequate provisions should be made for storing. Pecans can be kept in good condition until the following season if they are placed in cold storage where the temperature is approximately 40°. The air should be dry and very little light allowed in the room.

Yields depend on variety, soil and treatment, age of tree. In 8 to 10 years after planting the tree may bear 6 to 20 or more pounds of nuts. Trees 100 years old may bear 600 pounds and more.

The pecan is probably attacked by fewer insects and diseases than almost any other fruit or nut. The most disastrous insect pest is the pecan case-bearer which attacks the young nuts a short time after they are set. Very often there are three to four generations of these insects in one season. These pests can be partially controlled by spraying just before the eggs hatch with a mixture composed of 3 pounds of arsenate of lead and 50 gallons of water.

The most common disease is the pecan scab, caused by a fungus that attacks the leaves, twigs, and nuts, principally the nuts. This disease is especially serious when western varieties are planted near the coast. Resistant varieties should be set, as far as possible, in sections where the scab is known to be prevalent. Bordeaux mixture should be used to spray for the pecan scab.

PECTIANTIA: *Mitella pentandra.*

PEDALIACEÆ. Pedalium Family. About 14 genera of the oriental tropics, mostly herbs but sometimes shrubs, with opposite lvs. or the upper alternate, covered with slime-secreting hairs or glands, irregular gamopetalous fls. having 5-lobed limb, 4 stamens, usually superior 2-4-celled ovary, and capsular frs; allied to Bignoniaceæ and Martyniaceæ. Only the genus Sesamum is cult. for the oily seeds and medicinal purposes.

PEDATE: said of a palmately lobed or divided leaf of which the two sides are again 2-cleft; bird-footed.

PEDICEL: stem of one flower in a cluster.

PEDICELLARIA: *Gynandropsis.*

PEDICULARIS. Wood-Betony. Lousewort. *Scrophulariaceæ.* Herbs sometimes planted in the border or the rock-garden for the showy terminal bracted spikes of purplish, red, rose-colored or white 2-lipped tubular fls., and the finely cut foliage. Propagated by seed and division. Some of them are probably partially parasitic on roots and may not find the proper connections.

canadensis. Pubescent per. to 1½ ft.: lvs .to 5 in. long, pinnately parted: fls. yellow or reddish, rarely white, to ¾ in. long, Apr.–June: caps. three times as long as calyx. N. S. to Fla. and Mex.

lanceolata. Per. to 3 ft., nearly glabrous: lvs. to 5 in. long, pinnately lobed: fls. yellow, to ¾ in. long, Aug.–Oct.: caps. about length of calyx. Conn. to Neb.

palustris. Ann. or bien. to 2 ft., glabrous: lvs. to 2 in. long, pinnately parted: fls. purple seldom white, ¾ in. long: caps. twice as long as calyx. N. N. Amer., Eu.

verticillata. To 7 in.: lvs. 1–2-pinnately parted: fls. red, ½ in. long. Arctic regions.

PEDILANTHUS. *Euphorbiaceæ.* Trop. American odd succulent shrubs with milky juice, alternate simple lvs., fls. in showy cyathia (see *Euphorbiaceæ*), and capsular fr.; grown for ornament in warm climates. For cult. see *Succulents.*

retusus. Much like the following but the lvs. obtuse and usually notched at end and midrib not keeled underneath. Brazil. A state with white-bordered lvs. is grown in the tropics and is to be expected in Fla.

tithymaloides. Redbird-Cactus. Slipper-Flower. Jew-Bush. To 6 ft.: lvs. ovate, to 4 in. long, pointed, with midrib winged below: fls. (cyathia) red or purple, to ¾ in. long, pointed, in dense terminal cymes. W. Indies, Cent. Amer., N. S. Amer. Vars. cucullatus and variegatus have lvs. bordered with white.

PEDIOCACTUS. *Cactaceæ.* One small simple or cespitose strongly tubercled very spiny cactus with dry deshiscent fr., areoles at first very woolly but nearly naked with age: fls. massed in woolly center of plant. See *Cacti.* **P. Simpsonii** (*Echinocactus* and *Mammillaria Simpsonii*). Snowball Cactus. Depressed-globular, to 6 in. broad, radial spines 15–20 white and needle-like, centrals 5–7 and stouter: fls. somewhat funnelform, pinkish, less than 1 in. long, partially closing at night, massed in center in whitish or brown wool. Kans. to Wash. and New Mex.

PEDIOMELUM: *Psoralea esculenta.*

PEDUNCLE: stem of a flower-cluster or of a solitary flower.

PEEPUL: *Ficus religiosa.*

PEJIBAYE: *Guilielma Gasipaes.*

PELARGONIUM. Storksbill. Geranium of florists (see *Geranium*). *Geraniaceæ.* Per. herbs or shrubs with entire, lobed or dissected lvs., irregular fls. in axillary 2-many-fld. umbels, the calyx with a nectar-spur adnate to the pedicel, stamens 10, and fr. of 5 valves which coil as they open. Species here entered are S. African or hort. derivatives.

Geraniums are commonly grown as house and bedding plants. Propagated by cuttings. Bloom can be secured in four or five months. Plants over a year old are not satisfactory for the common house or conservatory subjects and should be discarded after cuttings are taken, although the Domesticum group may be retained longer. Plants of the common or fish geranium grown out-of-doors may be lifted in autumn and kept until cuttings can be taken from them for next year's plants. If wanted for winter bloom in the window, cuttings should be taken in summer. The show geraniums may be kept several years; cuttings taken late in spring will produce blooming plants the following winter or summer.

acerifolium (*Geranium citriodorum*). MAPLE-LEAVED G. Shrubby, to 3 ft.: lvs. 3–5-angled or -lobed, about 3 in. across: fls. deep rose or purplish, in many-fld. umbels.

alchemilloides (*P. malvæfolium*). To 1½ ft., hairy: lvs. 5–7-lobed, to 3 in. across: fls. white veined with rose, in 3–6-fld. umbels.

crispum. Woody, to 3 ft.: lvs. numerous and small, 1 in. or less long, crisped on the margin, lemon-scented: fls. pink or rose, in 1–3-fld. umbels.

denticulatum. To 1 ft.: lvs. with long linear deeply toothed lobes: fls. lilac or rose-purple, in 1–3-fld. umbels.

domesticum. SHOW, FANCY, or LADY WASHINGTON GERANIUMS or PELARGONIUMS. To 1½ ft., soft-hairy: lvs. 2–4 in. across, obscurely lobed, toothed: fls. large, white, pink and red, the two upper petals with dark blotches, in few- to many-fld. umbels. Cultigens of many kinds.

filicifolium: a name sometimes applied to *P. denticulatum.*

fragrans. To 1 ft.: lvs. 1 in. across, the margins crenate or crisped: fls. whitish with pink veins, in 4–8-fld. umbels.

fulgidum. Shrubby: lvs. pinnately 3-parted into lobed or cut toothed segms.: fls. bright scarlet with darker lines, in many-fld. umbels.

graveolens. ROSE G. Woody, to 3 ft.: lvs. deeply 5–7-lobed, the divisions again lobed and toothed, fragrant: fls. rose or pink veined with purple, in 5–10-fld. umbels.

hederæfolium: *P. lateripes.*

hortorum. FISH G. Succulent, 1–2 ft. or more when grown in the open: lvs. 3–5 in. across, scalloped and crenate-toothed, with fishy odor: fls. red, pink, salmon, white, in many-fld. umbels. Cultigens of many races.

lateripes (*P. hederæfolium*). Similar to *P. peltatum* and differing chiefly in having cordate rather than peltate lvs.

Limoneum. LEMON G. A garden hybrid, lemon-scented, and with purple and lilac fls.

malvæfolium: *P. alchemilloides.*

odoratissimum. APPLE or NUTMEG G. Lopping plants with branches to 1½ ft. long: lvs. 1 in. across, crenate, sweet-scented: fls. white or whitish, in 5–10-fld. umbels.

peltatum. IVY G. Trailing or somewhat climbing plants with branches to 3 ft.: lvs. 2–3 in. across, shallowly 5-angled or -lobed: fls. rose-carmine varying to white, the upper petals with dark markings, in 5–7-fld. umbels.

quercifolium. OAK-LEAVED G. Shrubby, to 4 ft.: lvs. pinnately lobed with 2 to 3 toothed or angled lobes on each side: fls. pink to rose with dark markings, in 3–7-fld. umbels.

Radula. To 1 ft.: lvs. deeply lobed into narrow toothed divisions: fls. rose with dark markings, in 5-fld. umbels.

roseum: a garden name applied to plants of the *P. graveolens* type.

sæpeflorens. Garden hybrid between *P. reniforme* and probably *P. echinatum,* flowering from late summer to late spring under glass: fls. bright rose with light spot in center and 2 dark marks.

terebinthinaceum. A garden hybrid between *P. quercifolium* and *P. graveolens.*

vitifolium. GRAPE-LEAVED G. Shrubby, to 3 ft.: lvs. 2–3 in. across, with 3 shallow angled crenate lobes: fls. rose or pink with darker veins, in 7–16-fld. umbels.

zonale. One of the species from which the *P. hortorum* group is probably derived; apparently not in general cult. in its original form.

PELECYPHORA. HATCHET CACTUS. *Cactaceæ.* Small cespitose tubercled cactus with watery juice, the tubercles strongly flattened sidewise and not on ribs and topped with elliptic areole bearing 1 scale-like pectinate spine and with woolly axils: fls. central on the plant. See *Cacti.* **P. aselliformis.** Body cylindric to 4 in. high and half as much in diam., tubercles in spirals: fls. bell-shaped, purplish with outer segms. sometimes white, more than 1 in. broad. Mex. For *P. pectinata* see *Solisia pectinata.*

PELICAN-FLOWER: *Aristolochia grandiflora.*

PELLÆA. CLIFF-BRAKE. *Polypodiaceæ.* Small rock-loving ferns with nearly uniform lvs. 1- or more pinnate, and sori in a marginal band, the segms. reflexed; of wide distribution mostly in temp. and warm-temp. regions. Some of them are grown in rock-gardens and a few in cool greenhouses. They prefer lime-rock situations. See *Ferns.*

adiantoides: *P. viridis.*

atropurpurea. Hardy: lvs. tufted, leathery, to 1 ft. long and 6 in. wide, 1–2-pinnate, segms. to 2 in. long, on dark purple stipes to 8 in. long. N. Amer.

densa: *Cheilanthes densa.*

falcata (*Platyloma falcatum*). Lvs. leathery, to 1½ ft. long and 3 in. wide, 1-pinnate, the lanceolate or oblong segms. to 2 in. long. India to New Zeal.

gracilis: *Cryptogramma Stelleri.*

hastata: *P. viridis.*

rotundifolia (*Allosurus rotundifolius*). Lvs. to 1 ft. long and 1½ in. wide, 1-pinnate, segms. oblong to orbicular, to ¾ in. long. New Zeal.—Sometimes seen in greenhouses.

viridis (*P.* and *Pteris adiantoides. P. hastata*). Lvs. to 2 ft. long, 2–3-pinnate, segms. oblong to ovate. Afr.

PELLIONIA. *Urticaceæ.* Herbs with alternate lvs. and unisexual fls. borne commonly in dense cymes; native in Asia and Pacific Isls.; grown in greenhouses and baskets for the attractively colored sts. and lvs.; require warmth and moisture. Propagated by cuttings and division.

Daveauana. Sts. prostrate, to 2 ft. long: lvs. oblong or orbicular, to 2½ in. long, bronzy olive-green, paler along midnerve. India to Cochin-China.—Some of the material cult. under this name is *Ruellia Devosiana.*

pulchra. Sts. creeping, purplish: lvs. oblong, light green with black nerves, pale purple beneath. Cochin-China.

PELLITORY: *Parietaria.*

PELTANDRA. ARROW-ARUM. *Araceæ.* Herbs native in the bogs of E. N. Amer., having arrow-shaped entire lvs. with long sheathing petioles, and unisexual fls. borne on spadices which are shorter than the spathes; sometimes transferred from the wild and easy to colonize.

virginica. Lvs. about 1 ft. long and 6 in. wide, the petioles about 3 times longer: spathes green, to 8 in. long. Me. to Fla. and Mo.

PELTARIA. SHIELDWORT. *Cruciferæ.* A few glabrous per. herbs of the Medit. region: lvs. entire, clasping on st.: fls. small, white or rose, in terminal clusters: fr. or silicle orbicular or nearly so. **P. alliacea** is a low per. with an onion-like odor, useful in borders for its numerous white fls. in summer; it grows 1–1½ ft. high, branched.—Grown readily from seeds, blooming the following year, also by division.

PELTATE: attached to its stalk inside the margin; peltate leaves are usually shield-shaped.

PELTIPHYLLUM. *Saxifragaceæ.* One per. herb similar to Saxifraga, native on banks of streams in Ore. and Calif. **P. peltatum** (*Saxifraga peltata*). UMBRELLA PLANT. To 4 ft.: lvs. basal, to 2 ft. across, 9–15-lobed and toothed, petioles often to 3 ft. long: fls. numerous, white or pinkish, ½ in. across, in terminal corymbs, appearing before the lvs., Apr.—Sometimes planted in wet places, and hardy in parts of the E.

PELTOPHORUM (*Baryxylum*). *Leguminosæ.* Trop. trees with 2-pinnate lvs., showy yellow fls. in terminal panicles, and flattened winged pods; commonly cult. for ornament in the tropics.

dubium. Large tree, rusty-tomentose: lfts, 20–30-pinnate, to ½ in. long: pods to 3 in. long. Brazil.

ferrugineum: *P. inerme.*

inerme (*P. ferrugineum*). To 50 ft., brown-tomentose: lfts. 10–20-pinnate, to ¾ in. long: pods to 3½ in. long. Ceylon, Malaya, N. Australia.

PENICILLARIA SPICATA: *Pennisetum glaucum.*

PENIOCEREUS. *Cactaceæ.* Slender plant with an enormous turnip-shaped root which is sometimes 2 ft. diam., and angled sts., spines similar on all the areoles. See *Cacti.* **P. Greggii** (*Cereus Greggii*). DEERHORN CACTUS. Sts. somewhat erect to 10 ft. but not rising high, to 1 in. thick, pubescent on young plants, spines small and blackish, radials 6–9 and central 1 or 2: fls. white tinged red outside, nocturnal, to 8 in. long, the segms. acute. W. Tex. to Ariz., Mex.

PENNANTIA. *Icacinaceæ.* A small genus native in New Zeal., Norfolk Isl. and Australia: shrubs or trees: lvs. alternate: fls. diœcious or polygamous, in terminal panicles or corymbs: fr. a small fleshy drupe.

corymbosa. To 35 ft.: lvs. obovate or oblong, to 4 in. long, usually toothed or lobed: fls. white, fragrant, diœcious: fr. black, ⅓ in. long. New Zeal.

PENNISETUM (*Gymnothrix*). *Gramineæ.* Tall ann. and per. herbs of trop. and subtrop. regions, spikelets subtended by bristles and borne in spike-like contracted panicles; several grown for ornament and *P. glaucum* for grain and forage. See *Grasses.*

alopecuroides (*P. japonicum*). Per. to 4 ft.: lvs. long and narrow, to 2 ft. and ¼ in. or less broad: spikes solitary and terminal, to 6 in. long, silvery with purplish anthers and long bristles. China.

americanum: *P. glaucum.*

atrosanguineum: a form of *P. Ruppelii.*

cupreum: a form of *P. Ruppelii.*

glaucum (*P. americanum* of authors. *Penicillaria spicata*). PEARL, INDIAN or AFRICAN MILLET. Ann. to 10 ft.: lvs. to 3 ft. long and 2 in. wide, rough: spike solitary and terminal, very dense and cat-tail-like, to 1½ ft. long and 1 in. thick: fr. bluish or whitish and used for food. Cultigen.

japonicum: *P. alopecuroides.*

latifolium. Per. to 4 ft.: lvs. to 1 ft. long and 1 in. wide: spikes several on the st., to 4 in. long, green, nodding, with long bristles. Peru to Brazil and Uruguay.

longistylum: *P. villosum.*

macrophyllum: *P. macrostachyum.*

macrostachyum (*P. macrophyllum*). Per. to 5 ft.: lvs. to 1 ft., and to 1 in. broad: spikes solitary and terminal, to 1 ft. long, E. Indies. Var. **atropurpureum** has purplish lvs.

purpureum. NAPIER-GRASS. Per. to 12 ft.: lvs. to 1 in. wide: spikes in dense panicles, purplish or yellow, to 8 in. long. Afr.—Grown for fodder in the S.

Ruppelianum: *P. Ruppelii.*

Ruppelii (*P. Ruppelianum*). FOUNTAIN-GRASS. Per. to 4 ft., curving: lvs. to 2 ft., ⅛ in. or less broad, often involute: spikes solitary and terminal, to 1 ft. or more long, nodding or curved, rose, purple or copper-colored in cult. forms, with long bristles. Abyssinia. See *Grasses.*

villosum (*P. longistylum*). Per. to 2 ft.: lvs. 4 in. and more long and ¼ in. across, spikes solitary and terminal, to 4 in. long, with long feathery bristles. Abyssinia.

PENNYROYAL: *Mentha Pulegium.*

PENNYWORT: *Cotyledon Umbilicus.*

PENSTEMON (*Pentstemon, Pentastemon*). BEARD-TONGUE. *Scrophulariaceæ.* Herbaceous perennials or shrubs with opposite or whorled lvs., bright colored 2-lipped tubular fls. in terminal racemes or panicles in summer, with 4 fertile and 1 sterile stamen, and capsular frs.; mostly native in N. Amer.

Nearly all penstemons succeed in full sun but in a hot dry place they do not last long. Many species are not hardy North, but many others are, especially if given winter protection. Some forms of *P. gloxinioides* are treated successfully as annuals. Propagated by seed, somewhat by division, rarely by cuttings in summer.

acuminatus. To 2 ft., glaucous and glabrous: st.-lvs. ovate, to 3 in. long, entire: fls. blue, ¾ in. long; sterile stamen bearded. Wash., Ore.—Name has been used for *P. secundiflorus* and *P. Fendleri.*

albidus. To 1 ft., the st. glandular-pubescent: st.-lvs. lanceolate or oblong, toothed, to 2½ in. long: fls. white, ¾ in. long; sterile stamen slightly bearded. Minn. to Tex.

alpinus (*P. glaber* var. *alpinus*). To 1 ft., glabrous: st.-lvs. lanceolate, to 4 in. long, entire: fls. bluish-purple, 1 in. long; sterile stamen glabrous. Rocky Mts.

angustifolius (*P. cæruleus*). To 1 ft., glabrous and glaucous: lvs. linear or linear-lanceolate, to 2½ in. long, entire: fls. blue, ¾ in. long; sterile stamen bearded. S. D. to Mont. and N. Mex.

antirrhinoides (*P. Lobbii*). Shrub to 6 ft.: lvs. linear or oblong, ½ in. long: fls. yellow, to ¾ in. long, very broad; sterile stamen bearded. S. Calif.

arizonicus. To 8 in., glabrous: lvs. oval, crenate or entire, leathery: fls. purplish, 1 in. long; sterile stamen glabrous. Ariz.

atropurpureus: hort. name for *P. campanulatus.*

barbatus (*Chelone barbata*). To 6 ft., glabrous: lvs. lanceolate or linear, entire: fls. red, 1 in. long, strongly 2-lipped, the lower lip bearded; sterile stamen glabrous. Utah to Mex. Var. **coccineus,** fls. scarlet.

Barrettæ: listed name.

Bradburyi: *P. grandiflorus.*

Brandegei. To 2 ft., usually glabrous: st.-lvs. ovate, to 2¾ in. long; basal lvs. glaucous: sterile stamen nearly glabrous. Mts., Colo.

cæruleus: *P. angustifolius.*

cæspitosus. Sts. decumbent, to 8 in. long, pubescent: lvs. spatulate, to ½ in. long: fls. lilac-purple, to ¾ in. long, the sterile stamen bearded. Wyo. to Colo.

calycosus. To 4 ft., nearly glabrous: lvs. spatulate to lanceolate, to 6 in. long, entire or toothed: fls. 1 in. long, purple; sterile stamen bearded. Ind. to Ala.

campanulatus. To 2 ft., nearly glabrous: lvs. lanceolate, toothed: fls. 1 in. long, rose-purple or violet, sometimes white; sterile stamen bearded. Mex., Guatemala.

Cardwellii. Evergreen, to 10 in., from woody base, mostly glabrous: lvs. thick, lanceolate or ovate, to 1 in. long, sharp-serrate: fls. purple, to 1½ in. long; sterile stamen slender and short. Ore.

centranthifolius. To 3 ft., glaucous: lvs. ovate-lanceolate, thick, to 2½ in. long, entire: fls. scarlet, 1 in. long, the lobes very short; sterile stamen glabrous. Calif. to Ariz.

Cobæa. To 2 ft., pubescent: lvs. oblong or ovate, to 5 in. long, toothed: fls. 2 in. long, purple, scarcely 2-lipped; sterile stamen bearded. Mo. to Tex.

comarrhenus. To 16 in., nearly glabrous: lvs. oval or spatulate, to 4 in. long: fls. deep blue, 1 in. long; sterile stamen bearded. Utah, Colo.

confertus. To 2 ft.: lvs. oblong to linear, to 2 in. long, entire, glabrous: fls. yellow, densely hairy patch on lower lip, to ½ in. long; sterile stamen bearded. Alta. to Wash.

cordifolius. Pubescent half climbing shrub: lvs. ovate, to 2 in. long, toothed: fls. to 1¼ in. long, scarlet, the limb short; sterile stamen bearded. S. Calif.

cristatus: *P. erianthera.*

cyananthus (*P. glaber* var. *cyananthus*). To 3 ft., glabrous and glaucous: lvs. ovate, entire: fls. 1 in. long, blue; sterile stamen bearded. Utah, Ida., Wyo.

cyathophorus. To 16 in.: lvs. spatulate to orbicular, 2½ in. long: fls. pinkish-purple, ½ in. long; sterile stamen bearded. Colo., Wyo.

Davidsonii. Matted prostrate alpine with sts. to 2 in.: lvs. ovate, ⅓ in. long, entire: fls. lilac-purple, to 1½ in. long; sterile stamen bearded. Calif. to Wash.

deustus. To 1 ft., nearly glabrous, alpine: lvs. ovate to oblong-lanceolate, to 1¼ in. long, toothed: fls. blue, ⅓ in. long; sterile stamen glabrous. Wyo. to Wash. and Calif.

diffusus. To 2 ft., rather bushy and pubescent: lvs. ovate or lanceolate, 2 in. or more long, deeply toothed: fls. ¾ in. long, blue or purple; sterile stamen bearded. B. C. to Ore.

Digitalis (*P. lævigatus* var. *Digitalis*). To 5 ft., nearly glabrous: lvs. ovate to lanceolate, to 7 in. long, toothed: fls. 1 in. long, white or pinkish, tube dilated at middle; sterile stamen bearded. Me. to S. D. and Tex.

Douglasii. Similar to *P. fruticosus* but dwarf and with broad short lvs. Mts., Ore., Wash.

Eatoni. To 2 ft., glabrous: lvs. ovate to linear-lanceolate, to 4 in. long: fls. bright red, 1 in. long; sterile stamen bearded. Utah, Colo., Ariz.

erianthera (*P. cristatus*). To 16 in., pubescent: st.-lvs. oblong or linear, entire: fls. purplish, 1 in. long; sterile stamen with long yellow hairs. N. D. to Wash.

fruticosus. Shrub to 3 ft.: lvs. spatulate, about 1 in. long, toothed: fls. purple, 1 in. long; sterile stamen glabrous. Alta. to Wash. and Ida.

gentianoides: *P. Hartwegii.*

glaber (*P. Gordoni*). To 2 ft., glabrous: lvs. oblanceolate, to 6 in. long, entire: fls. blue or purple, to 1¼ in. long; sterile stamen slightly hairy. N. D. to Wyo. Var. **roseus** is listed.

gloxinioides. A race of variants from *P. Hartwegii* or hybrids between *P. Hartwegii* and *P. Cobæa*, in many colors.

Gordoni: *P. glaber.*

gracilis. To 16 in.: lvs. oblanceolate to linear-lanceolate, to 3 in. long: fls. lilac or whitish, ¾ in. long; sterile stamen bearded. Man. to Sask. and N. Mex.

grandiflorus (*P. Bradburyi*). To 6 ft., glabrous: lvs. obovate to ovate, to 2½ in. long, entire: fls. 2 in. long, lavender-blue; sterile stamen bearded. Ill. to N. D. and Wyo.

Hallii. Tufted alpine to 8 in., glabrous: lvs. linear-lanceolate to linear, entire: fls. violet, to ¾ in. long, with very short tube; sterile stamen bearded. Colo.

Hartwegii (*P. gentianoides*). To 4 ft., nearly glabrous: lvs. ovate-lanceolate to lanceolate, entire: fls. to 2 in. long, scarlet, slightly curved. Mex.

heterophyllus. Shrub to 5 ft., glabrous: lvs. lanceolate to linear, to 2½ in. long, entire: fls. purple, to 1¼ in. long; sterile stamen glabrous. Calif.

hirsutus (*P. pubescens*). To 3 ft., sticky-pubescent: lvs. oblong or lanceolate, to 4½ in. long, toothed: fls. 1 in. long, purplish or violet, densely bearded in the throat; sterile stamen bearded. Me. to Va. and Wis.

humilis. To 1 ft., pubescent: lvs. ovate to lanceolate, to 1¼ in. long, entire: fls. deep blue, less than ½ in. long; sterile stamen bearded. Wyo., Ida., Utah.—Name has been used for *P. virens* of Colo.

isophyllus. To 2 ft., nearly glabrous: lvs. lanceolate, entire: fls. nodding, 1½ in. long, scarlet, the throat white-pubescent. Mex.

labrosus. To 2½ ft., glabrous and glaucous: lvs. linear or oblanceolate, to 4½ in. long, entire: fls. scarlet, to 1½ in. long; sterile filament glabrous. Calif. and Lower Calif.

lætus. To 14 in., pubescent: lvs. lanceolate or linear, to 3 in. long, entire: fls. blue or bluish-purple marked with white, 1 in. long; sterile stamen glabrous. Ore., Nev., Calif.

lævigatus (*Chelone Pentstemon*). To 3 ft., nearly glabrous: lvs. oblong or lanceolate, to 6 in. long, toothed: fls. purplish, to 1 in. long; sterile stamen bearded. Pa. to Fla.

linarioides. To 1½ ft., pubescent: lvs. linear to thread-like, to 1 in. long: fls. lilac or purple, ½ in. long; sterile stamen bearded. New Mex., Ariz.

Lobbii: *P. antirrhinoides.*

Menziesii. Woody at base, about 6 in. high: lvs. oblong to ovate, to ¾ in. long: fls. 1 in. long, violet-blue to purple; sterile stamen bearded. B. C. to Ore.

mexicanus: *Allophyton mexicanum.*

Murrayanus. To 3 ft., glabrous and glaucous: lvs. ovate to oblong, to 4 in. long, upper connate: fls. deep scarlet, 1 in. long; sterile stamen glabrous. Ark., Tex.

nemorosus (*Chelone nemorosa*). To 2 ft.: lvs. ovate to lanceolate, to 2 in. long, short-petioled: fls. violet-purple, 1 in. long, in loose clusters. Wash. to Calif.

Newberryi. To 20 in., woody at base: lvs. orbicular or ovate, to 1¼ in. long, toothed, leathery: fls. red, about 1 in. long; sterile stamen bearded at apex. Calif.

ovatus. To 4 ft., pubescent: lvs. broad-ovate, to 3 in. long, toothed: fls. blue changing to purple, ¾ in. long; sterile stamen bearded. Ore. to B. C.

Palmeri. To 3 ft., glabrous: lvs. ovate to lanceolate, to 4 in. long, toothed, upper connate: fls. cream-white tinted with pink, 1 in. long, short-tubed; sterile stamen bearded. Utah and Ariz. to Calif.

pinetorum: *P. Wilcoxii.*

procerus. To 1 ft.: lvs. oblanceolate, to 3 in. long, glabrous: fls. purplish-blue, to ½ in. long; sterile stamen bearded. Sask. to B. C. and Calif.

pubescens: *P. hirsutus.*

pulchellus. Similar to *P. campanulatus*, with violet or lilac fls. with white veins, throat spotted. Mex.

puniceus. To 6 ft., very glaucous: lvs. ovate: fls. 1 in. long, scarlet; sterile stamen bearded. Ariz., Mex.

pygmæus: hort. name for a dwarf alpine form.

Rattani. To 1½ ft.: st.-lvs. oblong- or triangular-ovate, to 2¼ in. long, toothed: fls. lavender, ¾ in. or more long; sterile stamen slightly hairy. Calif. Var. minor has smaller fls.

Richardsonii. To 3 ft., glabrous: lvs. ovate to lanceolate, to 3 in. long, deeply toothed or pinnatifid: fls. red, 2 in. long; sterile stamen slightly bearded. B. C. to Ida.

Roezli. To 1 ft.: lvs., lanceolate or linear: fls. pale blue or violet, ½ in. long; sterile stamen glabrous. Mts., Calif.

rupicola. Decumbent shrub to 4 in., pubescent: lvs. ovate or orbicular, to ½ in. long, glaucous: fls. rose-crimson, 1½ in. long; sterile stamen glabrous. Wash.

Scouleri. Shrub to 1½ ft., slightly pubescent: lvs. lanceolate, to 2 in. long, toothed: fls. lilac, to 2 in. long; sterile stamen glabrous. B. C. to Calif.—Probably only a var. of *P. fruticosus.*

secundiflorus. To 2 ft., glabrous and glaucous: lvs. oblanceolate, to 3 in. long, entire: fls. lilac, ¾ in. long; sterile stamen bearded. Wyo. to New Mex.—Name has been used for *P. unilateralis.*

Smallii. To 4 ft.: lvs. lanceolate or ovate-lanceolate, to 6 in. long, toothed: fls. pink-purple striped with white within, 1 in. long, with yellow hairs in throat; sterile stamen bearded. N. C., Tenn.

speciosus (*P. glaber* var. *speciosus*). To 2 ft., glabrous: lvs. oblanceolate to linear-lanceolate, to 4 in. long, entire: fls. bluish-purple, 1 in. long; sterile stamen glabrous. Wash. to Calif.

spectabilis. To 6 ft., glabrous and glaucous: lvs. ovate or ovate-lanceolate, to 3½ in. long, toothed: fls. 1 in. or more long, rose-purple or lilac; sterile stamen glabrous. Ariz., Calif.

stenosepalus: *P. Whippleanus.*

Torreyi (*P. barbatus* var. *Torreyi*). Similar to *P. barbatus* but with larger scarlet fls., lower lip not bearded. Colo. to Mex.

tubiflorus. To 3 ft., nearly glabrous: lvs. ovate to lanceolate, to 4 in. long, entire: fls. scarcely 2-lipped, white or tinged purple, ¾ in. long; sterile stamen bearded. Mo. to Ark. and Okla.

unilateralis. To 2 ft., glabrous: lvs. oblanceolate to linear-lanceolate, to 4 in. long: fls. blue, ¾ in. long, in one-sided infl.; sterile stamen glabrous. Wyo. to Utah.

venustus. To 2 ft., nearly glabrous: lvs. lanceolate, to 2 in. long, toothed: fls. light purple, 1 in. long; sterile stamen hairy. Wash., Ore., Ida.

Whippleanus (*P. stenosepalus*). To 1½ ft.: lvs. spatulate to linear-lanceolate, to 3 in. long: fls. purple or lavender, to ¾ in. long; sterile stamen bearded. Wyo. to New Mex.

Wilcoxii (*P. pinetorum*). To 4 ft., glabrous: lvs. ovate, to 3 in. long, entire: fls. bright blue or pink, to ¾ in. long; sterile stamen bearded. Wash. to Mont.

PENTAGLOTTIS (*Caryolopha*). *Boraginaceæ.* One European per. herb differing from Anchusa in technical characters of the nutlet: fls. in long-peduncled lf.-subtended glomerules. **P. sempervirens** (*Anchusa sempervirens*). To 2 ft.: lvs. broadly ovate: fls. rich blue, in spring and summer: grown for ornament.

PENTAPTERYGIUM. *Ericaceæ.* Asian epiphytic shrubs with alternate leathery lvs., tubular fls. solitary or clustered, and fr. a berry. Grown in Calif.

serpens. Sts. drooping: lvs. oblong, to ⅜ in. long, margins recurved: fls. bright red with darker V-shaped markings, ¾ in. long. Himalayas.

PENTAS. *Rubiaceæ.* African herbs and subshrubs with opposite lvs., long-tubular fls. in corymbs, and capsular frs.; grown in warm greenhouses or bedded out in S. U. S. Propagated by cuttings of half ripe wood over heat.

carnea: *P. lanceolata.*

lanceolata (*P. carnea*). To 2 ft., somewhat woody at bottom: lvs. ovate to lanceolate-oblong, to 6 in. long: fls. pale purple, 1 in. long, hairy in throat. Trop. Afr., Arabia.

PENTASTEMON, PENTSTEMON: *Penstemon.*

PEONY: *Pæonia.*

PEPEROMIA. *Piperaceæ.* Herbs, usually succulent and often prostrate or somewhat scandent, widely distributed in trop. regions, having minute bisexual fls. borne in dense slender spikes; grown as foliage plants in the greenhouse.

Peperomias require warm temperature and careful watering. Propagated by cuttings of stems or leaves in sand over bottom heat, and by rooting joints when produced. The cultivated kinds are small plants, suitable for pot culture.

arifolia: *P. Sandersii.*

blanda. Sts. weak: lvs. opposite or in 3's, obovate, to 1½ in. long; spikes to 4 in. long. Venezuela to Bolivia.

crassifolia. Sts. decumbent, to 1 ft.: lvs. alternate, orbicular, ½ in. long: spikes to 3 in. long. Trop. Afr.—Plants grown under this name may belong to a different species.

maculosa. Sts. erect, green spotted with brownish: lvs. alternate, ovate, to 7 in. long: spikes to 1 ft. long. Trop. Amer.—Plants cult. under this name may be *P. Sandersii* var. *argyreia.*

nummularifolia: *P. rotundifolia.*

pellucida. To 8 in.: lvs. ovate or triangular, ¾ in. long: spikes ½ in. long. S. Amer.; nat. in tropics.

rotundifolia (*P. nummularifolia*). Sts. rooting at nodes: lvs. oblong to orbicular, about ¼ in. long: spikes to ¾ in. long. Trop. Amer.

Sandersii (*P. arifolia*). Stemless: lvs. ovate, to 5 in. long, peltate or splitting at base, the stalks dark red: spikes to 4 in. long. Brazil. In var. **argyreia** the lvs. are lighter colored between the veins.

PEPINO: *Solanum muricatum.*

PEPPER. The pepper of world commerce and spice markets is the small fruit or berries of *Piper nigrum*, known as black pepper when the outer shell is intact, white pepper when the shell is removed. The plant is native in the Old World tropics, but is now widely spread in warm countries.

The peppers of vegetable-gardens and green-grocery markets are the fruits of a very different plant, *Capsicum fruticosum* and its derivatives. The plants are tender while young, although they endure some frost in autumn. Their culture is that recommended for eggplant, being grown as annuals. A small seedsman's packet of seed is sufficient for a large number of plants, say 200. The large Bell peppers are the mildest, and are used for making "stuffed peppers" and other dishes. Paprika is made from the long pointed type of fruit. The small hot peppers are used for seasoning and sauces. Seeds would better be started indoors for the northern states, although early varieties bear well from seed sown in the open ground as soon as it is thoroughly warm. From the original pan or flat the little seedlings may be transplanted to other flats or to pots before putting them in the garden. Rows should be as far apart as will admit of good tillage, usually 2–3 feet, and the plants may stand 10 to 18 inches apart in the row depending on the variety. The commercial culture is not essentially different from that indicated above.

PEPPER: *Piper.* **-Tree**: *Schinus.* **-Tree, Monks**: *Vitex Agnus-castus.* **-Vine**: *Ampelopsis arborea.*

PEPPERBUSH, SWEET: *Clethra alnifolia.*

PEPPERIDGE: *Nyssa sylvatica.*

PEPPERMINT: *Mentha piperita.*

PEPPERWORT: *Marsilea.*

PERAMIUM: *Epipactis.*

PERDICIUM: *Gerberia.*

PEREGRINA: *Jatropha hastata.*

PERENNIAL, from the Latin *perennis*, enduring, perpetual, is a noun and adjective denoting in horticulture a plant that persists more than two years, a one-year plant being an annual and a two-year plant a biennial. All shrubs and trees are perennial, but the word ordinarily connotes an enduring herbaceous plant, one that remains year after year; the "perennial border" is comprised of such plants, among which may be larkspurs, peonies, columbines, sedums. A perennial may not endure indefinitely, however; many of them are at their best in about the third year and then gradually fail; but tansy and bouncing-bet may remain after the house falls down. It is enjoyable work to grow perennials from seed. Sown one spring, or sometimes in midsummer, the seeds should give fresh blooming plants the following season.

PERESKIA. *Cactaceæ.* About a score of leafy shrubby or arboreous or vine-like cacti native in Mex. and W. Indies to S. Amer., a few of them long known in cult. in warm countries: spines single, paired or clustered in axils of the broad alternate lvs., no glochids: fls. solitary, corymbose or paniculate, rotate. See *Cacti.*

Although the pereskias are leaf-bearing plants, their culture does not differ particularly from that of other cacti. They are used as stocks on which to graft other kinds but otherwise they are not much known as glasshouse subjects. They propagate from cuttings.

aculeata (*P. Pereskia*). Barbados-Gooseberry. Lemon-Vine. Erect at first but becoming a vine to 30 ft. long, axillary spines 2 or 3 and recurved: lvs. thick, lanceolate to ovate, acute, to nearly 3 in. long: fls. paniculate or corymbose, white, yellow or pinkish, 1–1¾ in. across. Trop. Amer.

Bleo. Tree to 20 ft., trunk to 4 in. diam. and becoming naked, spines in fascicles of 5 and 6 but on young shoots fewer: lvs. thin, oblong to oblanceolate, to 8 in. long: fls. rose-color, style red: fr. truncate and naked. Panama, Colombia.—The plant cult. under this name is *P. grandifolia.*

Godseffiana. Sport of *P. aculeata*, with lvs. mottled or blotched above with crimson, yellow and green, purplish underneath.

grandifolia. Shrub or tree to 15 ft., with very spiny trunk, spines 1 or 2: lvs. oblong, to 6 in. long: fls. in mostly few-fld. terminal clusters, rose-color or white and sepals green, style and stigma-lobes white: fr. pear-shaped, leaf-bearing. Brazil.—Usually cult. under the name *P. Bleo.*

Nicoyana. Tree to 25 ft., spines 1 and 1½ in. long or wanting: lvs. lanceolate or oblanceolate and nearly sessile, lateral veins nearly parallel: fls. yellow, petals fimbriate. Costa Rica.

Pereskia: *P. aculeata.*

spathulata: *Pereskiopsis spathulata.*

subulata: *Opuntia subulata.*

PERESKIOPSIS. *Cactaceæ.* Differs from Pereskia in bearing glochids on the areoles and in having opuntia-like fls., from Opuntia in carrying true lvs. and in tree-like or shrub-like habit: species 10 or more in hedges and thickets of Mex. and Guatemala. See *Cacti.*

spathulata (*Opuntia* and *Pereskia spathulata*). Branching bush to 6 ft., somewhat glaucous, branches deflexed, spines 1 or 2 and about 1 in. long: fls. red. Mex.

subulata: *Opuntia subulata.*

PEREZIA. *Compositæ.* Per. herbs native from Tex. to Patagonia, with alternate leathery lvs. and heads of rose, purple, white or blue disk-fls., solitary or in panicles; pappus of bristles. Sometimes planted for ornament.

microcephala. To 3½ ft.: lvs. oblong-ovate, to 7½ in. long, toothed, clasping: heads whitish or purplish, ½ in. or less long, in panicles. Calif.

multiflora. To 1 ft. or more: lvs. pinnately cut into triangular segms., to 6 in. long, spiny-margined: heads blue, in dense corymbs. Peru to Argentina.

PERIANTH: the floral envelope considered together; commonly employed for flowers in which there is usually no clear distinction between calyx and corolla, as the lilies.

PERICARP: the ripened ovary, or fruit.

PERILLA. *Labiatæ.* A few Asian herbaceous annuals, one of which is grown for the attractive colored foliage something like a Coleus: fls. small, in axillary or terminal simple or panicled racemes, the corolla-tube not exceeding the calyx.

Perillas require a sunny or half-sunny position, and the same treatment as other half-hardy annuals. Propagated by seed.

frutescens. The form known in cult. is var. **crispa** (var. *nankinensis*) with dark purple-brown or bronzy foliage: lvs. broad-ovate, to 4½ in. long, toothed: fls. white or reddish, ¼ in. long, in autumn. India to Japan. Other vars. have lvs. wrinkled or crisped, fringed or cut, sometimes variegated, in the trade under the names *atropurpurea, laciniata, frutescens laciniata.*

nankinensis: *P. frutescens* var. *crispa.*

PERIPLOCA. Silk-Vine. *Asclepiadaceæ.* Woody vines, ours deciduous, with opposite lvs., wheel-shaped fls. in terminal or axillary clusters, and milkweed-like frs.; native in S. Eu., Asia and trop. Afr., more or less hardy in N. U. S.

Silk-vines grow in well-drained soil in sunny situations. They may need winter protection in the North. Propagated by seeds, layers or cuttings under glass in summer.

græca. To 40 ft.: lvs. ovate-lanceolate, to 5 in. long: fls. greenish, brownish-purple inside, 1 in. across, in summer. S. Eu., W. Asia.

sepium. Lvs. narrower and fls. smaller than in the above. N. China.

PERISTERIA. *Orchidaceæ.* S. American orchids with pseudobulbs, large plaited lvs. and fls. in spikes, the sepals and petals similar and cup-shaped, the base of lip united with the column by broad wings. For cult. see *Orchids.*

elata. Holy-Ghost-Flower. Dove-Flower. Evergreen: pseudobulbs with 3–5 lvs. to 3 ft. long and 6 in. wide: fls. fragrant, waxy-white, the lip spotted inside with red, 2 in. across, in 15–25-fld. spikes to 5 ft. high, July–Aug. Panama.—Requires liberal supply of moisture, and general treatment given calanthes.

PERISTROPHE. *Acanthaceæ.* Herbs or shrubs native in the tropics of the Old World, with opposite entire lvs. and rose or purple tubular 2-lipped fls. in bracted clusters or solitary; grown in the greenhouse where they need abundant air and rich loamy soil. Propagated by cuttings.

angustifolia. Grown as ann.: lvs. lanceolate, to 3 in. long: fls. rose, in terminal clusters. Java. Var. **aureo-variegata** has lvs. variegated with yellow.

speciosa. Woody per. to 3 ft.: lvs. ovate, to 5 in. long: fls. violet-purple, 2 in. across, 2–3 together. India.

PERIWINKLE: *Vinca.*

PERNETTIA (commonly but not originally spelled *Pernettya*). *Ericaceæ.* Low evergreen shrubs adapted to rock-gardens, having small toothed lvs., urn-shaped nodding usually solitary fls., and fr. a bright colored berry persistent throughout the winter.

Pernettias thrive in sunny positions in rather moist peaty soil. Fairly hardy North. Propagated by seeds, cuttings of half-ripe wood, layers and suckers.

mucronata. To 2 ft., much branched: lvs. ovate to ovate-lanceolate, to ¾ in. long: fls. white or pinkish, ¼ in. long, May–June: fr. white to red or purple, as indicated in the names **alba, coccinea, lilacina, nigra, purpurea, rosea.** Magellan region to Chile.

PEROVSKIA. *Labiatæ.* Asian herbs or subshrubs with opposite lvs. and rather small 2-lipped fls. in whorls in terminal spikes; one species grown for ornament.

Perovskia succeeds in sunny places in good loam, and is fairly hardy North. Propagated by cuttings of young wood under glass.

atriplicifolia. To 5 ft., hoary-tomentose: lvs. ovate-lanceolate to lanceolate, to 2½ in. long, toothed: fls. blue, ⅓ in. long, the spikes forming panicles to 1½ ft. long, Aug.–Sept. W. Asia.

PERSEA. *Lauraceæ.* Evergreen trees with alternate entire lvs., small bisexual greenish not showy fls. in panicles, and fr. a berry or drupe, edible in the case of the avocado, which see for cult.

The perseas are small trees of warm and tropical regions, the avocado now much grown for fruit, the others more or less planted for ornament because of the laurel-like habit and foliage. Most of them bear greenish, reddish or glaucous young shoots. The ornamental kinds require no special treatment. Propagation by seeds and cuttings.

americana (*P. gratissima. P. Persea*). AVOCADO. Much branched tree to 60 ft. or more: lvs. elliptic or oval, 4–8 in. long, acute or short-pointed: fls. small, greenish, in close terminal panicles, the parts prominently gray-pubescent: fr. large, fleshy, pyriform to oblong or globular, with rich buttery flesh, thick skin, and one large seed. Trop. Amer., cult. in the warmest parts of U. S., as West Indian and Guatemalan avocado; somewhat nat. in S. Fla.; the fr. was formerly known somewhat as "alligator-pear," a name that should be discontinued. Var. **drymifolia** (*P. drymifolia*), is the Mexican avocado of cult.: lvs. mostly elliptic and acute at either end, anise-scented when crushed: perianth more or less persistent: skin of fr. thin and soft. See *Avocado.*

Borbonia (*P. carolinensis. Tamala Borbonia. Notaphœbe borbonica*). RED BAY. BULL BAY. Tree 30–40 ft.: lvs. oblong to long-oblong, tapering to base, glabrous and somewhat glaucous, to 6 in.: fls. few or several, in short-peduncled clusters: fr. blue or blue-black, about ½ in. diam. Del. to Fla. in swamps.—Sometimes planted for ornament.

carolinensis: *P. Borbonia.*

drymifolia: *P. americana* var.

gratissima: *P. americana.*

indica. Attractive small tree with finely pubescent or nearly glabrous young shoots: lvs. oblong to lance-oblong, to 6 in., coriaceous, pubescent underneath, mostly acute: fls. small and few in upper axillary peduncled clusters: fr. oblong, scarcely fleshy, ¾ in. long, Canary, Madeira, Azores Isls.—Planted for ornament in S. Calif. and Fla., named *Laurus indica* by Linnæus, but habitat given by him as Virginia.

leiogyna. TRAPP AVOCADO. Differs from *P. americana* in the perianth glabrous within and only sparsely pilose outside, pistil and staminodes glabrous. Probably trop. Amer.

Meyeniana. Tree, with elliptic obtuse or acutish lvs. glaucous beneath: fls. with silky-tomentose perianth, the outer parts ovate, inner twice as long and elliptic-oblong; staminodes usually hairy at tip. Chile.—Intro. in Calif.

Nanmu: *Phœbe Nanmu.*

Persea: *P. americana.*

pubescens (*Tamala pubescens*). SWAMP RED BAY. Shrub or small tree: lvs. elliptic, to 8 in. long, obtuse, tomentose beneath: fr. dark blue and bloomy, ⅓ in. long. N. C. to Fla. and Tex.

PERSICA VULGARIS: *Prunus Persica.*

PERSICARIA: *Polygonum.*

PERSIMMON. Although noteworthy varieties of the American persimmon, *Diospyros virginiana,* native from Connecticut and southern Iowa to Florida and Texas, have been introduced, no important orchard industry based on it has been developed. The small size of the fruit, its pulpy character when mature and the difficulties of transportation to distant markets have been real drawbacks not offset by its high quality and delicious flavor. Hence, persimmon culture has been undertaken with varieties of *Diospyros Kaki* introduced from Japan and China, commonly known as oriental or Japanese persimmons and as kaki.

Roughly, the oriental persimmons are adapted climatically to the cotton-belt. They are grown as garden fruits over wide areas but a commercial industry has been developed for the most part only in California, Texas, Florida, southern Georgia and the southern parts of those states bordering on the Gulf of Mexico. Outside of California, individual orchard holdings usually are not large.

The persimmon is not particular in its soil requirements. It may be grown on any good farming land, provided water is available for irrigation in dry sections and drainage is satisfactory where rainfall is heavy. Lands of good quality produce more abundant crops of finer fruits than do lighter soils.

Native persimmon stocks are employed for propagation in the southern and eastern districts entirely, while in California seedling *D. Kaki* and *D. Lotus* stocks are also used; the Lotus has been freely utilized in recent years. Native persimmon roots are adapted to moist soils, *D. Lotus* to dry soils, while *D. Kaki* is intermediate in its moisture requirements. *D. Lotus* has a fine fibrous root system while *D. Kaki* and *D. virginiana* have well developed tap-roots, naturally very deficient in lateral and fibrous roots, but their root systems can be greatly improved by transplanting and by root pruning. Propagation is by whip-grafting in winter just below the surface of the ground on one- or two-year seedling stocks or by shield-budding with long heavy buds just before the stocks become dormant in summer.

In the eastern districts persimmons are planted 15 by 20 feet apart each way. In California they are spaced the same distances on lighter soils and 25 to 30 feet on heavy soils. Orchards are clean-cultivated in spring and early summer, followed by cover-crops of cowpeas, beggarweed or crotalaria for summer, and oats, rye or vetch for winter. It is important that the organic matter content be well maintained. Commercial fertilizers are applied in spring and again in June as for other tree crops.

While many varieties of oriental persimmons may be found in gardens and a fruiting season from August to January maintained, commercial plantings are usually made with Tane-Nashi and Fuyu in the East and with Hachiya and Fuyu in California. Hyakume is present in the earlier California plantings in large numbers. Fuyu has the distinct advantage of being hard light-fleshed and non-astringent at all stages, while both Tane-Nashi and Hachiya are astringent until they are soft-ripe. Pollination is required for Fuyu in the eastern districts and a good pollinator such as Gailey should be interplanted one tree in ten.

Persimmons are attacked by such insects as white-fly, mealy-bug, white peach scale and black scale. These are controlled by spraying with miscible oil. The most serious pest in the southern and eastern districts is the flat-headed borer which attacks the trunk and branches. It is controlled by going carefully over the trees in spring, locating the places attacked, digging or cutting them out and painting with good tree paint or protexol.

PERSISTENT: remaining attached; not falling off annually or frequently, as leaves of pines; evergreen.

PERSONATE: said of a 2-lipped corolla the throat of which is closed by a palate, as in snapdragon and linarias: like a masked face.

PERSOONIA. *Proteaceæ.* Australian small trees or shrubs, one in New Zeal., with mostly alternate entire lvs., small yellowish or white fls., and fr. a drupe; one species intro. in Calif.

Toru. Tree to 40 ft.: lvs. linear-lanceolate, to 8 in. long, thick and leathery: fls. yellowish-brown, to ⅓ in. long, in rusty-pubescent axillary racemes: fr. reddish, to ⅔ in. long. New Zeal.

PERULARIA: *Habenaria flava.*

PERUVIAN BARK TREE: *Cinchona.*

PESCATORIA. *Orchidaceæ.* Trop. American epiphytes with fragrant showy fls. solitary in the axils of lvs., the lateral sepals united to form a chin, the lip clawed and with a thick crest at base; for cult. see *Orchids.*

cerina. Lvs. to 10 in. long and 1½ in. wide: fls. yellowish-white with golden-yellow lip, on stalks 2 in. long, May–July. Costa Rica.

Dayana. Lvs. to 1 ft. long and 2 in. wide: fls. on stalks 2 in. long; sepals and petals white spotted with red at tips; lip violet edged with white and with dark purple crest, June–Sept. Colombia.

Klabochorum. Lvs. to 16 in. long and 2 in. wide: fls. to 4 in. across, on drooping stalks to 2½ in. long; sepals and petals white tipped with purple; lip veined with purple and with purple hairs, June–July. Ecuador.

PETAL: one of the separate leaves of a corolla.

PETALOID: petal-like; of color and shape resembling a petal; it may be a bract, sepal, or expanded stamen.

PETALOSTEMUM. PRAIRIE CLOVER. *Leguminosæ.* Herbs, mostly per., with pinnate lvs., papilionaceous fls. in spikes, and short pods included in the calyx; native in N. Amer. and any of the species may be planted in the rock-garden, border or wild-garden.

candidum. To 2 ft.: lfts. oblong or oblanceolate: fls. white, in cylindric spikes to 4 in. long. Ind. to La. and Tex.

decumbens. Sts. decumbent or ascending: lfts. linear or linear-oblong: fls. pink or rose-purple, in ovoid or short-oblong spikes to ¾ in. long. Ark., Tex.

multiflorum. To 2 ft.: lfts. linear to oblanceolate: fls. white, in spikes ½ in. long. Kans. to Tex.

obovatum. To 20 in., silky-hairy: lfts. obovate or oval: fls. yellowish-white, in cylindric spikes to 4½ in. long. Tex.

oligophyllum. To 2½ ft.: lfts. linear or linear-oblong: fls. white, in oblong spikes to 3 in. long. Minn. to Ariz.

purpureum (*P. violaceum*). To 3 ft.: lfts. linear: fls. violet or purple, in dense spikes 2 in. long. Ind. to Sask. and Tex.

Searlsiæ. To 1½ ft.: lfts. linear-lanceolate to ovate: fls. rose, in dense oblong spikes to 2 in. long. Utah, Ariz.

Stanfieldii. To 1 ft.: lfts. linear: fls. rose-purple, in cylindric spikes to 1 in. long. Tex.

villosum. To 2 ft., ascending or decumbent, densely hairy: lfts. oblong or oblanceolate: fls. rose-purple or rarely white, in cylindric spikes to 4 in. long. Mich. to Tex.

violaceum: *P. purpureum.*

PETASITES. BUTTER-BUR. *Compositæ.* Herbaceous perennials with thick and often creeping rootstocks, large basal felty lvs. that appear after the very early clustered purple to white heads of diœcious disk-fls. or sometimes with ray-fls., the scapes scaly; pappus of bristles; native in the north temp. zone. Of easy cult. Usually increased by division; also by seeds.

fragrans. WINTER-HELIOTROPE. SWEET COLTSFOOT. To 1 ft.: lvs. orbicular, small toothed, green and silky below, evergreen: heads small, fragrant, pale lilac to purple. Medit. region.

hybridus (*P. officinalis. P. vulgaris*). To 2 ft.: lvs. reniform or orbicular, to 1 ft. across, toothed, gray-tomentose beneath: heads ½ in. across, purplish, fragrant, in dense spike-like racemes. Eu., Asia; nat. in E. N. Amer.

japonicus. To 6 ft.: lvs. to 4 ft. across: fl.-heads in a fastigiate thyrse. Isl. of Sachalin. Var. **giganteus** has densely clustered fl.-heads and wavy-margined lvs. —The stalks are used as a vegetable and the fl.-buds as a condiment.

niveus. To 1 ft.: lvs. broadly cordate, toothed, densely white-woolly beneath: heads pinkish-white. Eu.

officinalis: *P. hybridus.*

variegatus: trade name for a variegated form.

vulgaris: *P. hybridus.*

PETIOLE: leaf-stalk.

PETIOLULE: stalk of a leaflet.

PETIVERIA. *Phytolaccaceæ.* American herbs or subshrubs with alternate lvs. and small fls. in racemes or solitary; one species has medicinal properties and is sometimes planted under glass for interest.

alliacea. GUINEA-HEN WEED. To 3 ft., with a strong garlic odor: lvs. ovate or elliptic, entire: fls. pink, white or green, in long interrupted spike-like racemes. Trop. Amer.

PETREA. *Verbenaceæ.* Shrubs, grown out-of-doors in the S. and under glass, having opposite leathery simple lvs. and violet, purple or bluish fls. in long racemes. Propagated by cuttings of the shoots over heat and by seeds.

arborea. Resembling *P. volubilis* but an upright shrub or small tree with narrower lvs. which are acute, not obtuse or emarginate as sometimes in *P. volubilis.* Mex., N. S. Amer., Trinidad.

volubilis. PURPLE WREATH. Woody vine to 15 ft.: lvs. ovate to oblong, to 6 in. long, entire or wavy-margined, rough: fls. blue, in racemes to 8 in. long, in Mar.–Apr., the calyx-lobes enlarging in fr., persistent and becoming the showy part. Cuba to Brazil. Var. **alba** has white fls.—A showy and frequent vine in the tropics.

PETROCALLIS. *Cruciferæ.* One draba-like per. in the Pyrenees, Alps and east (another in Persia), grown in rock-gardens. **P. pyrenaica** (*Draba pyrenaica*). Mat-like, 2–3 in., with simple sts.: lvs. all radical in rosette, wedge-shaped, lobed: fls. white changing to pink: silicle or pod short, little longer than broad.

PETROCOPTIS. *Caryophyllaceæ.* Perennials of small size, the lvs. mostly tufted or in a rosette, fls. with uncut petals; a few species from the Pyrenees, sometimes used in the rock-garden. Very similar to Lychnis.

Lagascæ (*Lychnis Lagascæ*). Low, tufted, glaucous, to 4 in. high: lvs. linear to ovate-lanceolate, to ¾ in. long: fls. pale rose with white center, about ⅔ in. across.

PETROPHILA. *Proteaceæ.* Australian shrubs with stiff lvs. and white or yellow fls. borne beneath scales or bracts and forming dense spikes or cones; intro. in Calif.

biloba. Lvs. flat., ternately divided into obliquely ovate or oblong pungent-pointed segms. to ½ in. long: fls. hairy, to ¾ in. long: cones ¼ in. long.

media. Lvs. cylindrical, 2–3 in. or occasionally to 10 in. long: fls. hairy, about ½ in. long: cones ½ in. across.

Shuttleworthiana. Lvs. flat, divided into pungent-pointed segms. 1 in. long: fls. glabrous, ⅓ in. long: cones to 1 in. long.

PETROPHYTUM. *Rosaceæ.* Evergreen prostrate shrubs native in W. N. Amer. and adapted to the rock-garden: lvs. crowded, entire: fls. small, white, in terminal racemes: fr. a leathery follicle. It succeeds in sunny positions in limestone soil. Propagated by seeds and division.

cæspitosum (*Spiræa cæspitosa*). Forming mats to 3 ft. across: lvs. to ½ in. long: fl.-spikes to 2 in. long. S. D. to Calif.; hardy N.

PETRORHAGIA: *Tunica Saxifraga.*

PETROSELINUM. *Umbelliferæ.* European herbs with pinnately compound lvs., greenish-yellow or reddish fls. in compound umbels, and ovate compressed frs.; one species is grown as a garnish and for salads.

Seeds of parsley should be sown in rows 10–12 inches apart, and the seedlings thinned to 5 or 6 inches in the row. As germination is very slow, it is well to soak the seeds in warm water. For winter use roots may be transplanted to boxes or pots and kept in a sunny window.

hortense (*Apium Petroselinum*). Parsley. Bien. to 3 ft.: lvs. ternately decompound, a curled and crisped-lvd. form known as var. crispum and a fern-lvd. form as var. filicinum. Nat. in E. N. Amer. Var. radicosum, Turnip-rooted P., has thick parsnip-like edible roots.

PE-TSAI. A leaf vegetable, *Brassica pekinensis*, much grown in China and now well known in this country as "Chinese cabbage" and "celery cabbage." Annual and biennial; sown in spring, it produces a close mass of foliage and a tender central core in summer and early autumn. The leaves are used as greens, and the white heart for salad. For harder heads, the seeds should be sown later so that the plant will mature in late autumn. The excellence of the crop apparently depends much on the care practiced in seed selection. The product does not have the strong flavor and odor of real cabbages, and it should not be called a cabbage.

A related product is Pak-choi, *Brassica chinensis* and *B. parachinensis.* This plant does not produce the solid head of Pe-tsai, and it is more definitely biennial, if not even sometimes short-perennial.

All these plants are probably natives of eastern Asia.

PETTERIA. *Leguminosæ.* One deciduous shrub native in Dalmatia, sometimes planted for ornament. Cult. as for Laburnum. **P. ramentacea.** To 6 ft.: lvs. of 3 lfts. to 2 in. long: fls. yellow, papilionaceous, fragrant, in dense upright racemes to 3 in. long, in May and June: pods to 1½ in. long.

PETUNIA. *Solanaceæ.* Soft and clammy more or less hairy branching annuals and perennials, of weak straggling growth, with simple lvs., alternate or the upper ones opposite, and white, purple or reddish fls. funnel- or salver-shaped, fragrant, blooming all summer; native in S. S. Amer.

Petunias are treated as annuals in gardens and are very satisfactory for bedding, to fill in spaces in the border, and in window- and porch-boxes; also grown in the greenhouse. They require sunny exposure. Petunias may be propagated from seed, the large frilled and double forms sometimes from cuttings. These latter high-bred types require more care than the smaller single-flowered kinds; the seed should be started indoors; the weak plants usually have the most double and daintily colored flowers.

argentea: trade name for a form of *P. hybrida.*

Atkinsii: form of *P. hybrida.*

axillaris (*P. nyctaginiflora*). Large White P. Usually erect, sticky-pubescent, to 2 ft.: fls. dull white, to 2½ in. long, fragrant at night, tube 3–4 times as long as calyx. Argentina.

hybrida. Common Garden P. Reputed to be a series of hybrids between *P. axillaris* and *P. violacea,* funnel-shaped fl.-tube broader than in the former species and longer with a broader limb than in the latter, to 3½ in. long: growth stocky and plant often sticky. There are many vars. and strains with fls. varying in size, color and form, sometimes to 5 in. across, from white to deep red-purple often striped, with star-like markings radiating from the throat or irregularly marked, some deeply fringed or even full double; both tall and more or less dwarf forms.

inflata. Much like *P. violacea* but corolla-tube much broader as if swollen or inflated: lvs. rather narrow. Paraguay, Argentina.

nyctaginiflora: *P. axillaris.*

phœnicea: apparently one of the *P. hybrida* group.

violacea. Violet-flowered P. Sts. to 10 in. long, slender, prostrate or tips erect: fls. rose-red or violet, the tube lighter, funnel-shaped, to 1½ in. long, about twice as long as calyx, with unequal limb. Argentina.

PEUCEDANUM. *Umbelliferæ.* A large and complex group of herbs with lvs. that are much divided, white, yellow or rarely purple small fls. in umbels, and flattened frs.; one species is occasionally cult. for ornament.

Ostruthium (*Imperatoria Ostruthium*). To 3½ ft.: lvs. 1–2-pinnate into broad toothed segms.: fls. polygamous, white or pinkish. Mts. of Cent. and S. Eu.

PEUMUS. *Monimiaceæ.* One evergreen diœcious tree to 20 ft., native in Chile. **P. Boldus** (*Boldoa fragrans*). Boldo. Lvs. opposite, ovate, leathery and rough: fls. white, ½ in. across, in panicles: fr. an edible drupe.—Sometimes grown in S. Calif. The tree has many economic uses, as the hard wood is valuable for charcoal and implements, the bark for tanning and dyeing, and the lvs. have medicinal properties.

PEYOTE: *Lophophora Williamsii.*

PHACA: *Astragalus.*

PHACELIA. *Hydrophyllaceæ.* Herbs of more than 100 species in Amer., the larger part western, with mostly alternate lvs., blue, purple or white fls. in scorpioid cymes or racemes and deciduous corolla; some of them are grown for summer bloom in the flower-garden. The individual fls. are commonly not showy but produce a bold effect in mass.

Seeds of the annual species may be sown in spring where the plants are to stand. The perennials are propagated by division as well as by seeds.

bipinnatifida. Bien. to 2 ft.: lvs. pinnatifid: fls. violet or blue. Ohio to Ga. and Tenn.

campanularia (*P. minor* var. *campanularia*). Ann. to 8 in.: lvs. ovate, toothed: fls. blue. S. Calif., in dry or desert regions.

congesta. Ann. to 2½ ft.: lvs, pinnatifid, often finely dissected: fls. blue. Tex., N. Mex.

divaricata. Ann. to 1 ft., straggling: lvs. ovate or oblong, entire: fls. blue. Calif. Var. **Wrangeliana** has lvs. slightly lobed or toothed at base.

gloxinoides: *P. Whitlavia* var.

grandiflora: *P. Whitlavia.*

linearis (*Eutoca multiflora*). Ann. to 1 ft.: lvs. linear to lanceolate: fls. violet or white. Calif. to Wash. and Utah.

minor. Widespread hairy and viscid ann. in S. Calif., to 2 ft.: lvs. broad-ovate, coarsely serrate, to 2½ in. long: fls. long-campanulate, the lobes not reaching middle, blue or purple.—Known in cult. in its forms or relatives *P. campanularia* and *P. Whitlavia.*

Parryi. Ann. to 1½ ft.: lvs. ovate, toothed or lobed: fls. deep violet. Calif.

tanacetifolia. Ann. to 3 ft.: lvs. pinnatifid, finely cut like those of tansy: fls. blue or lavender. Calif.

viscida (*Eutoca viscida*). Ann. to 2 ft.: lvs. ovate, toothed: fls. deep blue. with purple or whitish center. Calif.

Whitlavia (*P. minor* var. *Whitlavia. Whitlavia grandiflora*). CALIFORNIA BLUEBELL. Ann. to 1½ ft.: lvs. ovate, toothed: fls. blue or purple with swollen corolla-tube. S. Calif.—Probably not specifically distinct from *P. minor*, but long known in gardens as *Whitlavia*. Var. **alba** has white fls. Var **gloxinoides** (*Whitlavia gloxinoides*) has white fls. with blue center.

Wrangeliana: *P. divaricata* var.

PHÆDRANTHUS. *Bignoniaceæ.* One showy Mexican evergreen climber grown in subtrop. climates and in cool greenhouses. Propagated by cuttings. **P. buccinatorius** (*Bignonia buccinatorius* and *B. Cherere*). Lvs. of 2 ovate or oblong lfts. to 3 in. long and a terminal 3-parted tendril: fls. blood- or purple-red with yellow base, funnelform, 4 in. long, in terminal racemes.

PHAIUS. *Orchidaceæ.* Epiphytic or terrestrial orchids with leafy sts. or several-lvd. pseudobulbs and fls. in terminal racemes, the sepals and petals similar, the lip 3-lobed, free, usually spurred behind. For cult. see *Orchids.*

flavus (*P. maculatus*). Pseudobulbs with 2–3 lvs. to 2 ft. long, spotted with yellow: fls. yellow with apex of lip brown-yellow and wavy, to 3 in. across, in 7–10 fld. racemes to 2 ft. high, Apr.–May. Malaya.

grandifolius. Pseudobulbs with 4–6 lvs. to 3 ft. long: fls. silvery-white outside and yellowish-brown inside, the lip purple bordered with yellowish-brown, to 4 in. across, in 12–18-fld. racemes to 4 ft. high. China, Australia.

maculatus: *P. flavus.*

Sanderianus. A hort. form said to have fls. to 6 in. across with copper-red sepals and petals and lip yellow at base, crimson in center, and white midlobe.

PHALÆNOPSIS. *Orchidaceæ.* Epiphytes with short leafy sts., thick leathery lvs. and fls. in racemes or panicles, the sepals and petals equal or the latter larger, the lip 3-lobed and united with base of column, sometimes with appendages at apex; raised in a greenhouse with minimum temperature not below 65°; grown in osmundine or sphagnum and must be well supplied with moisture. For cult. see *Orchids.*

amabilis (*P. grandiflora. P. Rimestadtiana*). Lvs. to 1 ft. long and 5 in. wide: fls. white, the lip marked with yellow and red, to 4 in. across, in 6–15-fld. drooping panicles to 2½ ft. long, Oct.–Jan. Malaya.

Aphrodite (*P. Sanderiana*). Very similar to *P. amabilis* and probably a var. of it but with smaller fls. to 3 in. across and lip darker colored at base, Dec.–Apr. Philippines.

equestris (*P. rosea*). Lvs. to 6 in. long and 2 in. wide: fls. 1½ in. across, in 10–15-fld. nodding racemes to 1 ft. long; sepals and petals light rose; lip violet-rose, Aug.–Nov. Philippines.

Esmeralda: *Doritis pulcherrima.*

grandiflora: *P. amabilis.*

Luddemanniana. Lvs. to 10 in. long and 3 in. wide: fls. to 2 in. across, in few-fld. racemes about length of lvs.; sepals and petals whitish spotted with red, the lip violet-red with lighter lines, May–June. Philippines. Var. **ochracea** has yellowish fls. barred with ochre.

Rimestadtiana: *P. amabilis.*

rosea: *P. equestris.*

Sanderiana: *P. Aphrodite.*

Schilleriana. Lvs. to 1½ ft. long and 5 in. wide, mottled with gray above and purple beneath: fls. rose-purple, to 3 in. across, in many-fld. drooping panicles to 3 ft. long, Feb.–May. Philippines.

Stuartiana. Lvs. to 1 ft. long and 5 in. wide: fls. 2 in. across, in drooping panicles; sepals and petals white spotted with red-brown; lip yellow spotted with red-brown, Nov.–Feb. Philippines.

violacea. Lvs. to 1 ft. long: fls. with violet-rose sepals and petals and purple lip, 2 in. across, in 2–4-fld. racemes, May–July. Sumatra.

PHALANGIUM: *Anthericum Bicheti.*

PHALARIS. *Gramineæ.* Ann. and per. grasses with flat lvs. and flattened spikelets in narrow panicles or spikes; native in Old World and N. Amer. and ornamental. See *Grasses.*

arundinacea. REED CANARY-GRASS. Per. to 6 ft.: lvs. to 1 ft. long and ¾ in. wide: panicles dense, to 8 in. long, branches erect. Eu., Asia, N. Amer. Var. **picta** (var. *variegata*), RIBBON-GRASS, has lvs. striped with white and yellowish, common in yards as clumps or patches and sometimes infrequently blooming.

canariensis. CANARY-GRASS. Ann. to 2 ft.: lvs. to 6 in. long and ¼ in. wide: spikes ovoid, to 1½ in. long. Eu.; nat. in N. Amer.—Grown for the shining straw-colored seeds which are fed to birds.

minor. Similar to *P. canariensis* but with cylindric-oblong spikes and differing in floral characters. Eu.

stenoptera. Per. to 1½ ft. or more, with short vertical or ascending branched rhizomes: lvs. ¼ in. or less broad: panicle spike-like, dense, often lilac. Probably Medit. region.—Sometimes mistakenly written *stenophylla.* It has been sold as "Peruvian winter-grass."

PHASEOLUS. BEAN. *Leguminosæ.* Warm-country herbs, mostly twining, native in warm regions and extensively grown for the edible seeds and pods: lvs. of 3 lfts. or sometimes reduced to 1: fls. papilionaceous, in axillary racemes or clusters: pods flattened. For cult. of the annual garden beans, see *Bean*.

aconitifolius. Moth B. Ann., trailing or diffuse, to 2 ft.: lfts. divided into 3–5 narrow lobes: fls. yellow: pods to 2 in. long; seeds oblong, very small. Probably E. Indian.

acutifolius var. latifolius. Tepary B. Ann., bushy or twining: lfts. ovate, pointed: fls. white or violet: pods to 3 in. long; seeds roundish, ¼ in. or more long. Ariz., Mex.

angularis. Adzuki B. Ann., bushy, to 2½ ft.: lfts. ovate, abruptly short-pointed, sometimes slightly 3-lobed: fls. bright yellow: pods to 5 in. long; seeds oblong, ¼ in. or less long. Asia.

aureus. Mung B. Green or Golden Gram. Ann. to 3 ft. and more: lfts. ovate, acuminate: fls. yellow: pods to 4 in. long; seeds globular, small. Probably E. Indian.

calcaratus. Rice B. Ann., half-climbing: lfts. ovate, pointed: fls. bright yellow: pods to 5 in. long; seeds oblong, ¼ in. or more long. Asia.

Caracalla. Snail-Flower. Corkscrew-Flower. Per., twining to 20 ft.: lfts. ovate, pointed: fls. light purple or yellowish, fragrant, the keel coiled like a snail-shell. Tropics.

coccineus (*P. multiflorus*). Multiflora B. Scarlet Runner. Per. but grown as ann., tall-twining: lfts. broadly ovate: fls. bright scarlet, large: pods to 1 ft. long; seeds broad, to 1 in. long. Trop. Amer. Var. **albus,** White Dutch Runner, has white fls. Var. **albonanus** is a bushy form with white seeds and var. **rubronanus** is erect and has red fls.

limensis (*P. lunatus* var. *macrocarpus*). Lima B. Per. but grown as ann., high-climbing: lfts. ovate, long-pointed: fls. white or yellowish: pods with thick margins, to 5 in. long; seeds flat, ½ in. and more long. Trop. Amer. Var. **limenanus,** Bush or Dwarf Lima, is a bushy form.

lunatus. Sieva B. Civet B. Ann., climbing: lfts. broadly ovate, long-pointed: fls. white or yellowish: pods to 3½ in. long, seeds flat and thin, ½ in. long. Trop. Amer. Var. **lunonanus,** Dwarf Sieva B., is a bush form. Var. **salicis,** Willow-leaf B., has narrowly lanceolate lvs.

Metcalfei (*P. retusus*). Metcalfe B. Per. with fleshy roots: lfts. oblong, obtuse: fls. reddish-purple: pods to 2½ in. long; seeds circular, about ½ in. long. New Mex., Ariz., Mex.

multiflorus: *P. coccineus.*

Mungo. Urd. Black Gram. Ann., spreading, to 3 ft.: lfts. ovate, acuminate: fls. yellow: pods to 2 in. long; seeds oblong, small. Probably E. Indian. Var. **radiatus** (*P. radiatus*), sts. and pods with silky reddish pubescence.

nanus: perhaps *P. vulgaris* var. *humilis*, but identity uncertain.

radiatus: *P. Mungo* var.

retusus: *P. Metcalfei.*

trilobus. Ann. or per., trailing to 2 ft.: lfts. ovate, lobed: fls. minute: pods 2 in. long. Old World tropics.

trinervius. Per., twining: lfts, ovate, often lobed: fls. yellow or reddish: pods to 2½ in. long. Malaya.—Grown as cover-crop in tropics.

vulgaris. Kidney B. Haricot. Ann., tall-twining: lfts. ovate, long-acuminate: fls. white, yellowish or violet-purple: pods to 8 in. long; seeds oblong or globular, about ½ in. long. Probably American. Var. **humilis,** Bush B., is a low non-climbing form; the common garden and field bean.

PHEASANTS-EYE: *Adonis.*

PHEBALIUM. *Rutaceæ.* Shrubs with alternate simple lvs. and small white or yellow fls. usually in corymbs; native in Australia and New Zeal. and adapted to cult. in Calif.

argenteum. Lvs. lanceolate, to 4 in. long, entire: infl. densely covered with silvery scales. W. Australia.

PHEGOPTERIS: *Dryopteris.*

PHELLODENDRON. Cork-Tree. *Rutaceæ.* Ornamental trees from E. Asia with the aspect of Juglans, bearing opposite pinnate lvs., small greenish diœcious fls. in terminal panicles or corymbs, and black berry-like frs.

Cork-trees are hardy in the North and adapted to most soils. Propagated by seeds, cuttings over heat, and root-cuttings stored over winter in moist sand or sphagnum.

amurense. To 50 ft., with corky bark: lfts. 5–13, glabrous and glaucous beneath. China, Japan.

chinense. To 30 ft.: lfts. 7–13, pubescent beneath. China. Var. **glabriusculum** is pubescent only on veins.

japonicum. To 30 ft.: lfts. 9–13, pubescent beneath. Japan.

sachalinense. To 50 ft.: lfts. 7–11. glabrous beneath. Japan, Korea, China.

PHELLOSPERMA. *Cactaceæ.* One small cactus characterized by the large corky base of the seed. See *Cacti*. **P. tetrancistra** (*Mammillaria tetrancistra. M. phellosperma*). Solitary or cespitose, globular or becoming cylindric and 1 ft. long, root long and often thick, tubercles terete and axils naked, radials numerous and needle-like, centrals 1–4: fls. purple, about 1½ in. long, S. Utah and Nev., W. Ariz., S. Calif., Lower Calif.

PHENOMENAL BERRY: *Rubus loganobaccus.*

PHILADELPHUS. Mock-Orange. *Saxifragaceæ.* Floriferous popular shrubs, mostly erect but with curving or drooping branches, with simple commonly deciduous opposite lvs. and white fls., often very fragrant, solitary or in small clusters or racemes; a confused genus of wide distribution in Asia, Eu., U. S. and Mex., and many cultigens. Sometimes called Syringa but this name belongs to the lilac.

The mock-oranges commonly bloom in late spring. They are well adapted to shrubberies. If pruning is needed it should be after flowering, since the blossoms appear from wood of the previous year. They are propagated by seeds, layers, suckers and cuttings, the latter usually of mature wood. Well-marked varieties are grown from cuttings of soft wood in summer in frames.

brachybotrys: *P. pekinensis* var.

californicus. To 10 ft.: lvs. ovate, to 3 in. long, mostly glabrous beneath: fls. 1 in. across, fragrant, in panicles, calyx glabrous. Calif.

columbianus: *P. Gordonianus* var.

cordifolius. To 6 ft.: lvs. ovate, to 4 in. long, nearly glabrous beneath: fls. to 1½ in. across, in panicles, calyx glabrous. Calif.

coronarius. To 10 ft.: lvs. ovate to ovate-oblong, to 3 in. long, hairy only on veins beneath: fls. to 1½ in. across, very fragrant, creamy, in 5–7-fld. racemes, calyx usually glabrous. Eu., S. W. Asia. There are many hort. vars. such as: **aureus** (var. *foliis aureis*), lvs. yellow; **deutziæflorus,** double with narrow petals; **dianthiflorus,** double; **duplex** (var. *flore-pleno*), double or partially so, dwarf; **multiflorus plenus,** fls. double; **primulæflorus,** double with broad petals; **pumilus** (var. *nanus*), dwarf; **rosæflorus,** double; **salicifolius,** lvs. lanceolate; **variegatus,** lvs. bordered with creamy-white.

Coulteri. To 10 ft.: lvs. ovate to ovate-oblong, to 2 in. long, white-tomentose beneath: fls. about 1 in. across, with red spot at base of petals, solitary, calyx white-tomentose. Mex.

cymosus. Hybrid between *P. Lemoinei* and probably *P. grandiflorus:* lvs. elliptic-oblong, to 4 in. long, pubescent beneath: fls. 2 in. or more across, often double, in 3–9-fld. cymes or racemes, calyx glabrous. Hort. names belonging here are Bannière, Conquête, Mer de Glace, Norma, Perle Blanche, Rosace.

Delavayi. To 15 ft.: lvs. ovate-oblong, to 4 in. long, grayish-tomentose beneath: fls. 1½ in. across, very fragrant, in 5–13-fld. racemes, calyx glabrous and purple. W. China.

Falconeri. Hybrid between *P. coronarius* and probably *P. laxus:* lvs. ovate-lanceolate, to 3 in. long, nearly glabrous beneath: fls. 1 in. across, fragrant, in 3–7-fld. racemes.

floridus. Resembling *P. grandiflorus* but with lvs. pubescent beneath and calyx and pedicels densely pubescent. N. C., Ga.

gloriosus: *P. grandiflorus.*

Gordonianus. To 12 ft.: lvs. ovate to elliptic-oblong, to 3 in. long, pubescent beneath: fls. about 2 in. across, fragrant, in 7–11-fld. racemes, calyx slightly pubescent. B. C. to N. Calif. Var. **columbianus** (*P. columbianus*) is smaller throughout.

grandiflorus (*P. inodorus* var. *grandiflorus. P. gloriosus*). To 10 ft.: lvs. elliptic-ovate, to 5 in. long, nearly glabrous beneath: fls. 2 in. across, 1–3 together, calyx glabrous. N. C. to Fla. and Ala.

hirsutus. To 8 ft.: lvs. ovate, to 3 in. long, densely grayish-pubescent beneath: fls. 1 in. across, creamy, usually in 3's, calyx pubescent. N. C. to Ga. and Ala.

incanus. To 10 ft. or more: lvs. ovate to oblong-ovate, to 3 in. long, densely gray-pubescent beneath: fls. 1 in. across, in 5–7-fld. racemes, calyx densely tomentose. W. China.

inodorus. To 10 ft.: lvs. ovate, to 4 in. long, glabrous beneath except on veins, usually entire: fls. 2 in. across, 1–3 together, calyx glabrous. N. C. to Ga. and Miss.

Karwinskyanus. Tall shrub with long scandent branches: lvs. narrow-ovate, to 2½ in. long, hairy beneath: fls. about 1 in. across, in 5–13-fld. panicles, calyx hairy. Mex.—See *P. mexicanus.*

latifolius: *P. pubescens.*

laxus. To 4 ft.: lvs. drooping, elliptic-ovate to oblong-lanceolate, to 3 in. long, slightly hairy beneath: fls. to 1½ in. across, 1–3 together, calyx glabrous. Ga.

Lemoinei. Hybrid between *P. microphyllus* and *P. coronarius:* lvs. ovate to ovate-lanceolate, to 2 in. long, slightly hairy beneath: fls. 1½ in. across, very fragrant, in 3–7-fld. racemes. Some of the hort. forms are Avalanche, Boule d'Argent, Candelabra, Erectus, Manteau d'Hermine, Mont Blanc.

Lewisii. To 6 ft.: lvs. ovate, to 3 in. long, only pubescent in axils of veins beneath: fls. to 1¼ in. across, in 5–9-fld. racemes, calyx glabrous. Mont. to Wash. and Ore.

Magdalenæ. To 12 ft.: lvs. ovate, to 3 in. long, rough-pubescent beneath: fls. 1 in. across, in 7–11-fld. racemes, calyx pubescent. China.

maximus. Hybrid between *P. tomentosus* and *P. pubescens:* lvs. beneath and calyx tomentose.

mexicanus. To 15 ft. or more, with long scandent branches: lvs. ovate to lanceolate, to 3 in. long, slightly hairy beneath: fls. to 1½ in. across, fragrant, creamy, 1–3 together, calyx hairy. Mex.—The material commonly cult. under this name is *P. Karwinskyanus.*

microphyllus. To 4 ft.: lvs. oblong, to 1¼ in. long, entire, hairy beneath: fls. 1 in. across, very fragrant, usually solitary, calyx nearly glabrous. Colo. to New Mex. and Ariz.

nepalensis. To 6 ft.: lvs. ovate-oblong, to 4 in. long, glabrous except in axils of veins beneath: fls. 1½ in. across, pure white, in 5-fld. racemes, calyx glabrous. Himalayas.

nivalis. Hybrid between *P. pubescens* and *P. coronarius:* lvs. ovate, slightly pubescent beneath: fls. 1½ in. across, in 5–8-fld. racemes, calyx hairy.

pekinensis. To 6 ft.: lvs. oblong-ovate, to 3 in. long, glabrous except in axils of veins beneath, petioles purplish: fls. about 1 in. across, creamy, slightly fragrant, in 5–9-fld. racemes, calyx glabrous. N. China to Korea. Var. **brachybotrys** (*P. brachybotrys*) has short dense racemes and green petioles.

polyanthus. Hybrid between *P. Lemoinei* and probably *P. insignis:* lvs. ovate, 1 in. long, usually entire, hairy beneath: fls. 1½ in. across, in cymes or racemes, calyx pubescent. Some of the hort. forms are Favorite, Gerbe de Neige, Pavillon Blanc.

pubescens (*P. latifolius*). To 10 ft.: lvs. ovate, to 4 in. long, gray-pubescent beneath: fls. 1½ in. across, in 5–9-fld. racemes, calyx pubescent. Tenn. to Ala. and Ark.

purpurascens. To 12 ft.: lvs. elliptic- to lanceolate-ovate, to 2 in. long, pubescent beneath: fls. 1 in. across, pure white with purple glabrous calyx, very fragrant, in 5–9-fld. racemes. China.

purpureo-maculatus. Hybrid between *P. Lemoinei* and *P. Coulteri:* lvs. ovate, to 2 in. long, hairy beneath: fls. about 1 in. across, with purple spot at base of petals, 1–3 together, calyx slightly pubescent. Some of the hort. forms are Fantasie, Nuage Rose, Ophelia, Romeo, Surprise, Sybille.

satsumanus. To 8 ft.: lvs. ovate to ovate-lanceolate, to 3 in. long, hairy only in axils beneath: fls. 1 in. across, somewhat fragrant, in 5–9-fld. racemes, calyx nearly glabrous. Japan.

Schrenkii. To 6 ft. and more: lvs. ovate to oblong-lanceolate, to 5 in. long, hairy only on veins beneath: fls. 1½ in. across, in 5–7-fld. racemes, calyx hairy on nerves. Manchuria to Korea.

sempervirens: name sometimes applied to *P. mexicanus.*

sericanthus. To 12 ft.: lvs. ovate, to 4 in. long, hairy on veins beneath, the petiole often reddish: fls. 1 in. across, in 5–9-fld. racemes, calyx pubescent. China.

splendens. Hybrid between *P. grandiflorus* and probably *P. Gordonianus:* lvs. nearly glabrous: fls. 2 in. across, in 5-fld. racemes, calyx glabrous.

subcanus. To 10 ft.: lvs. oblong-ovate, to 5 in. long, pubescent on veins beneath: fls. 1 in. across, in 5–9-fld. racemes, calyx densely pubescent. China. Var. **Wilsonii** (*P. Wilsonii*) is larger.

tomentosus. To 10 ft.: lvs. ovate, to 3 in. long, grayish-pubescent beneath: fls. 1 in. across, fragrant, in 5–7-fld. racemes, calyx nearly glabrous. Himalayas.

verrucosus. To 10 ft.: lvs. ovate, to 4 in. long, pubescent beneath: fls. 1 in. across, in 5–7-fld. racemes, calyx pubescent. Origin uncertain.

virginalis. Hybrid between *P. Lemoinei* and probably *P. nivalis:* lvs. ovate, to 3 in. long, pubescent beneath: fls. double or partially so, in 3–7-fld. racemes, calyx pubescent. Some hort. forms are Albâtre, Argentine, Bouquet Blanc, Fleur de Neige, Girandole, Glacier, Virginal.

Wilsonii: *P. subcanus* var.

Zeyheri. Hybrid between *P. coronarius* and *P. inodorus* or *P. grandiflorus:* lvs. ovate, to 4 in. long, hairy only on veins beneath: fls. 2 in. across, in 3–5-fld. racemes, calyx glabrous.

PHILESIA. *Liliaceæ.* One evergreen shrub about 3 ft. high, native from Chile to Magellan. **P. buxifolia.** Lvs. alternate, narrow-oblong, about 1½ in. long, glaucous beneath: fls. rosy-red, 2 in. long, nodding: fr. a berry.—It thrives in cool temperatures and partially shaded situations and requires peaty soil; sometimes grown under glass. Propagated by cuttings of ripened wood which are slow in rooting.

PHILIBERTELLA: *Philibertia clausa.*

PHILIBERTIA. *Asclepiadaceæ.* Climbing herbs or subshrubs native from Tex. to Argentina, with opposite lvs., wheel- or bell-shaped fls. in umbels, and long slender frs.; grown in the open S., or under glass in a soil composed of loam, peat and sand. Propagated by cuttings over bottom heat.

clausa (*Philibertella clausa. Funastrum clausa*). Lvs. evergreen, ovate- or lanceolate-oblong, to 3 in. long: fls. white, ½ in. across, fragrant, in summer. Fla.

PHILLYREA. *Oleaceæ.* Evergreen shrubs or small trees native in the Medit. region, with opposite lvs., small white diœcious fls. in racemes in spring, and fr. a black 1-seeded drupe; grown in mild and warm climates for ornament. Propagated by seeds, cuttings of half-ripe wood under glass, by layers, and by grafting on the privet.

angustifolia. To 15 ft.: lvs. oblong- or linear-lanceolate, to 2 in. long, commonly entire: fr. ¼ in. long. S. Eu., N. Afr.

decora (*P. Vilmoriniana*). To 10 ft.: lvs. oblong to oblong-lanceolate, to 5 in. long, commonly entire, shining above: fr. ½ in. long. W. Asia.

latifolia. To 30 ft.: lvs. ovate, to 2 in. long, toothed, shining above: fr. ¼ in. long. S. Eu., Asia Minor. Var. **media** (*P. media*) is lower with smaller lvs. entire or wavy-toothed. Var. **spinosa** has spiny-toothed lvs.

media: *P. latifolia* var.

Vilmoriniana: *P. decora.*

PHILODENDRON. *Araceæ.* Mostly woody climbers native in trop. Amer., bearing thick lvs. which are entire or pinnately cut, sheathing petioles, and unisexual fls. on erect spadices slightly shorter than the fleshy spathes which are white, yellow or red.

Philodendrons are grown as foliage plants in the greenhouse and in the open in frostless countries, where they should be given supports on which to climb and abundant moisture. Propagated by division of the stems.

acuminatissimum. Lvs. arrow-shaped, the linear-oblong posterior obtuse lobes slightly twisted upwards, the anterior acuminate lobe to 1 ft. long: spathes to 3½ in. long. Ecuador.

Andreanum. Lvs. oblong-arrow-shaped, to 3 ft. long and 10 in. wide, shining green suffused with yellow. Colombia.

argyrea Sanderiana: hort. name.

asperatum (*P. imperiale*). Lvs. cordate-ovate, to 1½ ft. long and 1 ft. wide: spathes to 5 in. long, reddish outside, pale yellowish-white inside. Brazil.

bipinnatifidum. Sts. erect: lvs. 2-pinnate into linear or oblong segms., the terminal segm. 3–5-lobed: spathes about 8 in. long, purple outside and whitish inside. S. Brazil.

Carderi: *P. verrucosum.*

Devansayeanum. Lvs. ovate-cordate, to 2 ft. long and broad, long-acuminate, red when young: spathes to 6 in. long, margined with red, the tube white. Peru.

erubescens. Lvs. ovate-triangular, to 10 in. long and 5 in. wide: spathes to 6 in. long, dark purple. Colombia.

giganteum. Lvs. broadly cordate-ovate, to 3 ft. long and 2 ft. wide: spathes to 10 in. long, the limb pale green and tube purplish outside and red within. W. Indies.

gloriosum. Lvs. cordate-ovate, to 10 in. long and 8 in. wide, reddish on margins and pale green on nerves and beneath, petioles marked with white. Colombia.

grandifolium. Lvs. arrow-shaped, to 2 ft. long and 14 in. wide: spathes to 4 in. long, pale greenish-yellow outside and yellowish-white inside. Venezuela, Guiana.

imperiale: *P. asperatum.*

Lindeni: *P. verrucosum.*

Mamei. Lvs. cordate-ovate, to 10 in. long and 6 in. wide, deep green above irregularly spotted with silvery-white, petioles pinkish. Ecuador.

pertusum: *Monstera deliciosa.*

Selloum. Lvs. 2-pinnate into oblong lobes, the terminal segm. 3-lobed: spathes to 1 ft. long, white inside. Brazil, Paraguay.

spectabile. A name of uncertain botanical standing, said to have silky or velvety-green lvs. about 15 in. long.

tripartitum. Lvs. 3-parted, to 10 in. long and 3 in. wide, yellowish-green: spathes to 4 in. long, whitish. Trop. Amer.

verrucosum (*P. Carderi. P. Lindeni*). Lvs. ovate-cordate, to 8 in. long and 6 in. wide, shining green above with paler lines and sunken nerves, lined with salmon-violet beneath, the petioles deep red and armed with bristles: spathes purplish. Costa Rica, Colombia.

Wallisii. Lvs. broadly ovate-cordate, to 1½ ft. long and 1 ft. wide, deep green above: spathes to 5 in. long, brownish-green. Colombia.

PHILOTRIA: *Elodea canadensis*

PHLEBODIUM: *Polypodium.*

PHLEUM. *Gramineæ.* Mostly per. grasses with flat lvs. and spikelets in dense terminal spikes; native in temp. regions of the world and one valuable for pasture and hay. See *Grasses.*

pratense. Timothy. Herds-Grass. To 5 ft.: lvs. to 1 ft. long and ¼ in. wide: spikes to 8 in. long, cylindrical, awned. Eu., Asia; nat. in N. Amer.—An abundant meadow grass.

PHLOMIS. *Labiatæ.* Stout per. herbs or low shrubs with opposite lvs. and purple, yellow or white, 2-lipped fls. in axillary whorls subtended by hairy bracts, the upper lip densely hairy.

These are rather coarse plants suitable for the wild-garden and rear plantings. Propagated by seeds, cuttings, division, and *P. tuberosa* by underground tubers.

alpina. Per. to 1½ ft., sts. square: lvs. cordate, lower to 8 in. long and 6 in. across: fls. purplish, in 20–30-fld. whorls, the bracts subulate. Siberia.

cashmeriana. Per. to 3 ft., densely white-woolly, sts. cylindrical: lvs. leathery, linear-oblong, to 9 in. long: fls. pale purple, in whorls to 1½ in. across, the bracts subulate. Himalayas.

ferruginea: the plant cult. under this name is *P. fruticosa.*

fruticosa. Jerusalem-Sage. Erect more or less woody herb or shrub to 4 ft., densely white- or yellow-woolly: lvs. ovate or oblong, to 4 in. long, very rugose: fls. yellow, in 20–30-fld. whorls. the bracts ovate. S. Eu.

lanata. Shrub, the sts. square, densely yellow-woolly: lvs. ovate, 1 in. or less long, wrinkled: fls. yellow, in 6–8-fld. whorls, the bracts ovate-lanceolate. Italy.

Lychnitis. Lampwick Plant. Shrubby, to 1½ ft., densely tomentose: lvs. oblong-linear, to 3 in. long, clasping, the floral lvs. dilated at base: fls. yellow, in 6–10-fld. whorls, the bracts subulate. S. Eu.

pungens. Per. to 2 ft.: lvs. ovate-lanceolate, shining above, tomentose beneath: fls. purplish-violet, in 6–10-fld. whorls, bracts subulate. S. E. Eu.

Russeliana: *P. viscosa.*

samia. Per. to 3 ft., pubescent: lvs. ovate-oblong, wrinkled, tomentose beneath: fls. purple, in 10–15-fld. whorls, the bracts subulate. Greece.

spectabilis. To 6 ft., sts. cylindrical, tomentose: lvs. ovate-cordate, to 1 ft. across, on long petioles: fls. rose-purple, in many-fld. whorls to 2 in. across, the bracts thread-like. Himalayas.

tomentosa: the plant grown under this name is *P. fruticosa.*

tuberosa. Per. to 6 ft., nearly glabrous, with square sts. and tuber-like roots: lvs. cordate-ovate, to 8 in. long: fls. purple, in 30–40-fld. whorls, the bracts subulate. S. Eu., Asia.

viscosa (*P. Russeliana*). Shrubby, pubescent, viscid above: lvs. ovate to oblong-lanceolate, to 4 in. long, tomentose beneath: fls. yellow, in many-fld. whorls, the bracts subulate. Asia Minor.

PHLOX. *Polemoniaceæ.* Ann. and per. herbs with mostly opposite entire lvs. and bright-colored salverform fls. in shades of blue, purple, pink, crimson and white, borne in cymes or panicles; popular flower-garden subjects.

The annual phloxes are of easy culture in any garden soil but will bloom longer if given abundant moisture and plant-food. Seeds should be sown in early spring or sometimes started in boxes and transplanted. The perennial summer phloxes require fertile soil and plenty of water and should be set 2–3 feet apart. Clumps will bloom for three or four years and should then be divided. Propagated by side shoots. Seeds do not reproduce the type, and named or special forms are multiplied from the strong young shoots that arise from the crown or root as the plant spreads, and clumps may be divided. Most of the phloxes are hardy North.

adsurgens. Per., loosely tufted, with ascending sts. to 6 in. and more long: lvs. ovate or ovate-lanceolate, to 1 in. long: fls. rose or whitish, to 1 in. across, in cymes. Ore.

amœna. Per. to 1 ft., decumbent at base: lvs. oblong-lanceolate, to 2 in. long: fls. purple, rarely pink or white, to ¾ in. across, in terminal compact clusters subtended by an involucre of lvs., in spring and early summer. Va. to Fla.—Rarely cult., the plant grown under this name being *P. procumbens.*

Arendsii. Per. to 2 ft.: lvs. lanceolate-ovate to linear-lanceolate, to 4 in. long: fls. lavender or mauve, 1 in. across, in loose clusters to 6 in. across, in summer. Hybrid between *P. divaricata* and probably *P. paniculata.*

argillacea: *P. pilosa.*

bifida. Sand P. One of the subulate phloxes: low tufted hairy per. with well-separated nodes: lower lvs. mostly 1–2 in. long, awl-like: fls. pale violet to white with violet tube; corolla-lobes notched to nearly or about ⅛ in. deep; stamens partly exserted. S. W. Mich. to Tenn., Ark. and Kans.

canadensis: *P. divaricata.*

carolina: *P. ovata.*

cuspidata: a name often applied to *P. Drummondii* var. *stellaris.*

decussata: a name applied to hort. forms of *P. paniculata* and sometimes *P. maculata* or *P. suffruticosa.*

diffusa. Loosely tufted per. a few in. high: lvs. oblong-linear, ½ in. long: fls. white, ½ in. long, solitary. B. C. to Calif.

divaricata (*P. canadensis*). Blue P., or Wild Sweet William. Per. to 1½ ft., with many sterile creeping shoots: lvs. ovate to oblong, to 2 in. long: fls. pale violet-blue to mauve, to 1½ in. across, in open clusters, in spring; corolla-lobes mostly notched or erose. Que to Fla. and Tex. Color forms are vars. **alba** and **lilacina**. Var. **Laphamii** has entire corolla-lobes and large fls. of rich blue-violet.

Douglasii. Tufted per. to 10 in. across: lvs. linear, to ⅓ in. long: fls. white or lilac, ½ in. across, solitary. Wash. to Nev. and Calif.

Drummondii. Annual or Drummond P. Ann. to 1½ ft.: lvs. ovate to lanceolate, to 3 in. long, the upper alternate: fls. rose-red varying to white, buff, pink, red and purple, 1 in. across, in close clusters. Tex. Color forms are represented by such names as **alba oculata, atropurpurea, carnea, coccinea, rosea, violacea.** Var. **rotundata** has large broad petals, and is also known as **grandiflora** and **splendens.** Var. **stellaris**, Star P., has narrow cuspidate petals which are often cut and fringed.

glaberrima. Meadow P. Per. to 2 ft.: lvs. linear or linear-lanceolate, to 4 in. long: fls. purple, about ¾ in. across, in terminal clusters, in early summer. Va. to Fla. and Tex. Var. **suffruticosa:** see *P. suffruticosa.*

Hentzii: *P. nivalis.*

Hoodii. Tufted per. to 4 in.: lvs. subulate, to ⅓ in. long, woolly: fls. white, ⅓ in. across, solitary. Alaska to Neb.—An inconspicuous plant; the stock cult. under this name is likely to be *P. Douglasii* or other similar species.

maculata. Per. to 3 ft., with purple-spotted st.: lvs. lanceolate, to 5 in. long: fls. pink or purple, rarely pink or white, ½ in. across, in elongated panicles in summer. Conn. to Fla. and Miss.—Rarely cult., the plant so named usually being a form of *P. suffruticosa.*

multiflora. Stemless per. to 4 in.: lvs. broadly linear, to ¾ in. long: fls. lavender, fragrant, ¾ in. long, solitary, in spring. Mont., Colo.

nana. Per. to 9 in.: lvs. linear, to 2 in. long: fls. rose to white, 1 in. across, scattered or in corymbs. Tex. to Ariz.

nivalis. Trailing P. One of the subulate phloxes: hairy per. to 6 in.: lvs. awl-shaped, ¾ in. long: fls. pink or white, nearly 1 in. across, in spring; corolla-lobes entire or erose, or only shallowly notched if at all. Va. to Fla.—Has been confused with *P. subulata*, and comprises several supposed vars. of that species as *Hentzii* and *setacea.*

ovata (*P. carolina*). Per. to 2 ft.: lvs. ovate to oblong-lanceolate, to 2 in. long: fls. purple or sometimes pink, 1 in. across, in small clusters, in summer. Pa. to Ala.

paniculata. Summer Perennial P. Per. to 4 ft.: lvs. oblong-lanceolate to oval, thin and veiny, to 5 in. long: fls. pink-purple but varying into many colors as white, salmon, scarlet, lilac, purple, 1 in. across, in large panicles in summer and early autumn. Pa. to Fla. and La.—In many hort. forms it constitutes the common per. summer-blooming phlox of gardens.

pilosa (*P. argillacea*). Hairy per. to 1½ ft.: lvs. linear to lanceolate, to 3 in. long: fls. purple, varying to pink, violet and white, to ¾ in. across, in small clusters, in spring and early summer. Ont. to Fla. and Tex.

procumbens. Supposed hybrid between *P. stolonifera* and *P. subulata*, often grown as *P. amœna:* per. to 1 ft., decumbent at base: lvs. oblong to spatulate, to 2 in. long: fls. bright purple, to ¾ in. across, in spring.

reptans: *P. stolonifera.*

setacea: see *P. nivalis.*

Stellaria. Per. to 8 in.: lvs. linear or linear-lanceolate, to 2 in. long: fls. pale violet-blue or nearly white, ¾ in. across.—The plant cult. under this name is apparently a hybrid between *P. bifida* and *P. subulata.*

stellaris: *P. Drummondii* var.

stolonifera (*P. reptans*). Hairy per. to 1 ft., with long creeping sterile shoots: lvs. obovate to lanceolate, to 3 in. long: fls. purple or violet, ¾ in. across, in cymes, in spring and early summer. Pa. to Ga. and Ala.

subulata. Ground- or Moss-Pink. Per. forming mats, to 6 in.: lvs. crowded, awl-shaped, ½ in. long, evergreen: fls. bright purple, varying to pink and white, ¾ in. across, in spring; corolla-lobes shallowly notched. N. Y. to N. C. Color forms are indicated in vars. **alba, atropurpurea, lilacina** and **rosea.** Var. **Nelsonii** has white fls. with rose centers and is of compact habit.—Some of the hort. kinds named under this species belong to *P. nivalis.*

suffruticosa. Early Perennial P. Per. to 3 ft.: lvs. lanceolate to ovate, thick and scarcely veiny, to 5 in. long: fls. purple, varying to rose and white, about ¾ in. across, in panicles in early summer. Nativity uncertain.—Related to *P. glaberrima* and *P. maculata*, but apparently distinct from either; extensively cult. in several hort. forms.

PHLOX, NIGHT-: *Zaluzianskya capensis.*

PHŒBE. *Lauraceæ.* Trop. trees and shrubs with alternate leathery lvs., small fls. and fr. a berry; one species rarely cult. in S. Calif.

Nanmu (*Persea Nanmu*). Tree: lvs. oblanceolate, to 6 in. long and 2 in. wide: fls. in terminal corymbs about length of lvs., the perianth silky-pubescent. China.

PHŒNICOPHORIUM: *Stevensonia.*

PHŒNIX. *Palmaceæ.* About a dozen species of diœcious feather-palms in Afr. and Asia, unarmed except for the stiff spine-like basal pinnæ on the lvs., often sprouting or suckering at the base: trunk, if evident, covered with the bases of old petioles, at least toward the top: pinnæ induplicate in vernation, narrow, long-pointed, without midrib but with a nerve either side the sharp fold or ridge, sometimes fascicled on the rachis: spadices among the lvs.; spathe 1- or 2-valved, narrow and relatively small, more or less persistent, the peduncle of the pistillate spadix often greatly elongating; fls., small, yellowish, borne on the angles or curves of many slender often long branches; stamens 6: fr. an oblong or nearly globular drupe with a single grooved seed.—It is very difficult to make out the identity of many of the planted trees of phœnix, for some of the surest characters of separation are in staminate fls. and frs. which are usually not to be had together; as these palms are diœcious, one may have only the male or female tree; the conditions seem to be favorable for hybridization although this subject has received little careful attention. All the species are native in the eastern hemisphere and it is not known how or when the stock of the ornamental kinds reached this country, or what its particular origin may have been. There is also much natural variation in some of the species. Because of the confusion in the cult. phœnices it has seemed advisable to place rather full descriptions here as aids in identification. For cult. see *Date* and *Palm*.

acaulis. Apparently stemless, the trunk represented by an ovoid bulbiform caudex 1 ft. or less in diam. that rises little above the ground: lvs. to 6 ft., somewhat glaucous; pinnæ rather limp, to 20 in. long, with strong marginal nerves, nearly opposite and interruptedly fascicled; petiole with many stout spines: spadix 1 ft. or less long, peduncle very short or none, the 1-valved spathe that splits down the side arising at surface of ground or beneath; fruiting peduncle remaining very short, often not evident: fr. elliptic-oblong, about ½ in. long, red to blue-black, edible, the clusters sometimes half in the ground. N. and Cent. Bengal.—It is a question whether this species is in cult. with us; not all acaulescent phœnices belong here.

canariensis (*P. Jubæ. P. tenuis*). Strong tree to 50 and 60 ft. over all and more, with solitary straight trunk, the upper crown of foliage and the entire top in young plants strongly ascending but the lower lvs. hanging with age, the top becoming very large and broad, petioles and spines yellowish: lvs. 15–20 ft. long; pinnæ very many, light green, long-pointed, standing in different planes, the lower ones of which are long stout spines and those at the base fascicled or irregularly placed as well sometimes as some of those above the spines: peduncle of fruiting clusters elongating often to several ft. and drooping: fr. ellipsoid or globose-ovoid, 1 in. or less long, with a pulpy exterior, yellow and varying to reddish. Canary Isls., and now widely spread as a cult. plant; variable.—Trees grown in this country as *P. cycadifolia*, *P. leonensis* and *P. leonensis speciosa* belong here, although the *leonensis* of old hort. literature is supposed to be *P. reclinata*, and *cycadifolia* is accounted a form of *P. dactylifera*. One of the hardiest palms, thriving in Cent. Calif., middle and N. Fla., and upper Gulf Coast, making striking massive specimens on fertile moist soils.

cycadifolia: see *P. canariensis*; a name apparently applied to different things.

dactylifera. DATE. Tree to 100 ft. and more with slender trunk for the greater heights, suckering at base, upper part of crown with erect-ascending foliage and lower part with down-curving or declined foliage: lvs. grayish-glaucous, sometimes bluish; pinnæ 18 in. or less long, narrow and stiff, sharp-pointed, distichous: fr. cylindrical or long-oblong, 1–3 in. long, with thick very sweet flesh much prized for food; fruiting peduncle very much developed and elongated, flattened, yellowish or reddish, drooping or hanging with weight of fr.—Long domesticated, in various forms, probably native in W. Asia and N. Afr. but origin undetermined; commercially cult. for fr. in Calif. and Ariz., and widely planted in warm-temp. parts for ornament and interest.

farinifera: *P. pusilla.*

Hanceana: *P. humilis* var.

humilis (*P. Ouseleyana. P. pedunculata*). Small plant more or less soboliferous the trunk attaining 6–10 or 12 ft.: lvs. somewhat glaucous; pinnæ scattered and interruptedly fascicled, usually rather limp or flaccid, the marginal nerves faint: fruiting peduncle becoming much elongated: fr. small, ovoid, about ½ in. long, the pulp edible. India to Cent. China; variable. Var. **Hanceana** (*P. Hanceana*) is a hardy form with trunk 3 or 4 ft., and grayish-green foliage.

hybrida: a hort. name.

Jubæ: *P. canariensis.*

leonensis: see *P. canariensis.*

natalensis: *P. reclinata.*

Ouseleyana: *P. humilis.*

paludosa (*P. siamensis*). Small tree or tree-like shrub, forming dense clumps with several erect or inclined trunks to 25 ft., ringed at base: lvs. 6–10 ft., spreading and curving and forming an attractive mass; petiole scurfy, bearing slender spines; pinnæ 1–2 ft. long, both opposite and alternate and 2-ranked, ¾ in. or less broad, not stiff, lighter colored or mealy underneath, striate: fruiting spadix 3–4 ft. long: fr. ovoid, about ½ in., mucronate, red becoming black-purple; seed with basal embryo and in this respect differing from other phœnices. Bengal to Cochin-China.

pedunculata: *P. humilis.*

pumila: see *P. reclinata.*

pusilla (*P. farinifera*). Shrubby stoloniferous palm with very short trunk that is entirely covered with sheaths and does not elevate the top high: lvs. pale green, bearing one or more pairs of spines; pinnæ nearly opposite, in 4 rows or planes, rigid and prominently pointed: spadix 8–12 in. long, much branched and erect, the branches widely spreading: fr. ½ in. long, dull purple-black. S. India and Ceylon, near the sea.—Some of the stock known as *P. farinifera* may be *P. reclinata.*

reclinata (*P. natalensis. P. senegalensis. P. spinosa* and *spinifera*). Soboliferous producing several or many sts. in a close clump to 20 ft. or more high but making a single slender trunk to 40 ft. if suckers are removed, the trunks bearing lf.-scars: lvs. floccose underneath when young, particularly on the ribs, bearing scattered or paired spines below, reclinate or curved downward at the apex; pinnæ subopposite or alternate or in groups of 2 or 3, 1 ft. long more or less, firm or subrigid in texture, with sharp stiffish points: staminate fls. narrow and acute in bud and thereby differing from other phœnices: fr. ¾ in. or less long, ovoid-ellipsoid, brown or reddish. Trop. Afr. and south to Natal.—The best known African palm if the date is counted out and the most widespread. Variable; a popular and attractive palm, distinguished from *P. rupicola* by the stiffish appearance of the foliage and the tufted habit. The plant known in cult. as *P. pumila* probably belongs here.

Roebelenii. Dwarf fine-lvd. palm now planted in the open in the warm parts of the country and prized also as a pot plant. A plant was shipped probably from Singapore by Mr. Roebeleni, and described and named by James O'Brien in Gardeners' Chronicle in 1889. It is referred to *P. humilis* by some writers; probably it is the same as *P. Loureiri* (an older name) of Cochin-China (*P. humilis* var. *Loureiri* of Beccari); sts. usually several, 2–5 or 6 ft., sometimes swollen at base, erect or somewhat flexuose, covered at least toward top with lf.-bases: lvs. many, shiny green and somewhat glaucous, rather soft, gracefully curving and drooping, bearing numerous narrow long-attenuate opposite or subopposite pinnæ, with slender weak spines on petiole: fr. oblong, about ½ in. long, borne in a many-branched small spadix on a peduncle about 1 ft. long.

rupicola. Trunk slender and solitary, to 20 ft., naked of lf.-bases or becoming so, the crown with declined or drooping lower lvs., the foliage with a soft (or not stiff) appearance: lvs. bright green; pinnæ limp or flaccid, decurved, not conspicuously long-attenuate to sharp points, 2-ranked in one plane and not fascicled, represented by spines on the petiole: fr. oblong, ¾ in. long, shining yellow. India; usually growing among rocks.—A very graceful plant either for the open in the warmest parts of the country or for pots.

senegalensis: *P. reclinata.*

siamensis: *P. paludosa.*

spinosa (spinifera): *P. reclinata.*

sylvestris. WILD DATE. Trunk stout and solitary, to 50 ft., covered with bases of old lf.-stalks, bearing a large rounded very thick crown, lower lvs. decurved and drooping: lvs. long, grayish-green or glaucous-green; pinnæ very many, fascicled and in 2–4 planes, glaucous, rigid and long-acuminate into stiff points, the petiole spines 2–4 in. long: fr. olive-form or oblong-elliptic, about 1 in. long, orange-yellow, scattered on long drooping branches of the spadix, pulp very astringent. India, wild and also cult. for the making of sugar from the sap.—Frequently planted for ornament and interest in the warm parts of the U. S., being about as hardy as *P. canariensis*; fast-growing useful tree.

tenuis: *P. canariensis* in the literature, but the plants cult. under this name may belong to other species.

vinifera: a hort. name.

zeylanica. CEYLON DATE. Trunk solitary, to 20 ft., bearing old lf.-bases: lvs. relatively short, but with very many rigid pinnæ 1 ft. or less long standing at right angles in about 4 rows or planes and bright green with sharp points: fr. obovoid-oblong and apiculate at apex, about ½ in. long, red ripening to violet-blue or dark purple; pulp sweet, eaten in its native country. Ceylon, in woods.

PHŒNIX-TREE: *Firmiana simplex.*

PHOLIDOTA. *Orchidaceæ.* Epiphytic orchids with creeping rootstocks, small pseudobulbs, and small fls. in slender racemes, the sepals and petals similar, the lip sac-like; grown in a warm greenhouse. See *Orchids* for cult.

articulata. Pseudobulbs with 2 lvs. to 4 in. long: fls. pinkish-white with yellow spot, about ½ in. across, in 8–15-fld pendulous racemes, Apr.–June. Himalayas.

conchoidea: *P. imbricata.*

imbricata (*P. conchoidea*). Pseudobulbs with 1 lf. to 10 in. long: fls. whitish with 3 orange-yellow stripes at base of lip, about ⅓ in. across, in dense many-fld. racemes to 1 ft. long, the lateral sepals with sharp keels, Apr.–July. India and Malaya.

PHORADENDRON: see *Loranthaceæ.*

PHORMIUM. *Liliaceæ.* Two large per. herbs native of New Zeal., grown in warm climates as foliage clumps and sometimes in greenhouses, furnishing a strong fiber where native. Propagated by seeds sown in Feb. out-of-doors or in pots of rich compost; also by division.

Colensoi (*P. Cookianum*). To 7 ft.: lvs. to 5 ft. long and 2½ in. broad, less rigid than in *P. tenax:* fls. yellow, to 1½ in. long.

Cookianum: *P. Colensoi.*

tenax. New Zealand Flax. To 15 ft.: lvs. basal, to 9 ft. long and 5 in. broad, stiff, tough and leathery, splitting at apex, margined with red or orange line: fls. dull red, to 2 in. long, numerous on long scape. Var. **atropurpureum** has lvs. reddish-purple, var. **variegatum** lvs. striped with creamy-yellow and white and var **Veitchianum** has broad creamy-white stripes.

PHOTINIA. *Rosaceæ.* Asian shrubs and trees with alternate toothed lvs., white fls. in corymbs or short panicles, and fr. a small red berry-like pome.

The deciduous species are mostly hardy North and succeed in sunny positions. Propagated by seeds, by cuttings of young wood under glass, by layers, and by grafting on hawthorn or quince.

arbutifolia: *Heteromeles arbutifolia.*

arguta: *P. villosa* var. *lævis.*

Beauverdiana. Deciduous shrub or tree to 20 ft., not hardy N.: lvs. oblong, to 4 in. long: infl. 2 in. across. China.

Davidsoniæ. Evergreen tree to 45 ft., grown in S. U. S.: lvs. oblong, to 5½ in. long, shining above, paler beneath: infl. to 5 in. across. China.

dentata: name of uncertain application.

glabra. Evergreen shrub to 10 ft., to be grown far S.: lvs. obovate, to 3 in. long: infl. 4 in. across. Japan.

japonica: *Eriobotrya japonica.*

serrulata (*Cratægus glabra*). Evergreen shrub or tree to 40 ft., adapted to southern parts: lvs. oblong, to 8 in. long, dark and shining above, yellowish-green beneath: infl. to 6 in. across. China, where it is much planted.

villosa. Deciduous shrub or tree to 15 ft., hardy N.: lvs. obovate, to 3 in. long, hairy beneath: infl. to 2 in. across. Japan, Korea, China. Var. **lævis** (*Porthiæa arguta*) has smaller glabrous lvs.

PHRAGMITES. *Gramineæ.* Tall per. grasses with broad lvs. and soft hairy spikelets borne in large panicles; native in swamps and wet areas in north temp. zone and S. Amer. and one planted for ornament. See *Grasses.*

communis. Common Reed-Grass. To 15 ft.: lvs. to 1 ft. or more long and 2 in. wide: panicles to 1 ft. long. Swamps N. Amer., Eu., Asia. Var. **variegata** has variegated lvs.

PHRAGMOPEDILUM: see *Paphiopedilum.*

PHRYNIUM: *Calathea, Ctenanthe.*

PHYGELIUS. *Scrophulariaceæ.* Small shrubs grown in conservatories or in the open in sheltered situations as far north as Philadelphia, and as pot subjects under glass, for the terminal panicles of scarlet drooping tubular fls. having 5 nearly equal lobes: lvs. opposite: 2 species in S. Afr.

Propagated from seed or from cuttings taken from the late autumn shoots of outdoor plants. The plant is now infrequent in cultivation.

capensis. Cape Fuchsia. To 3 ft., sts. 4-angled or narrow-winged: lvs. ovate or ovate-lanceolate, to 5 in. long, toothed: fls. to 2 in. long, somewhat curved, purple-scarlet, in panicles to 1½ ft. long.

PHYLICA. *Rhamnaceæ.* Much branched small evergreen shrubs in S. Afr. of many species, one of which is grown sometimes under glass for ornament and probably in Calif. in the open: lvs. alternate and crowded, small and simple: fls. small, largely in close heads or spikes, petals often wanting or bristle-like, stamens 5: fr. a small caps.

ericoides. To 3 ft., with slender erect tomentose branches: lvs. small and linear or subulate, heath-like, tomentose underneath, margins revolute: fls. very small, in little terminal involucrate heads.

PHYLLAGATHIS. *Melastomaceæ.* Subshrubs with short thick sts., large simple lvs., rose fls. in a head, and capsular fr.; greenhouse subjects.

From March to September these plants require high temperatures and plenty of water at the roots. Propagated by cuttings of half-ripened wood or leaf-cuttings in February or March over heat.

rotundifolia. To 2 ft.: lvs. roundish, 6 in. long, plaited and glossy green above tinted with metallic blue and purple, coppery-red beneath with prominent veins: fls. ½ in. across. Sumatra.

PHYLLANTHUS. *Euphorbiaceæ.* Herbs, shrubs or trees with alternate simple lvs. which are often arranged in two ranks on lateral branches so as to resemble pinnate lvs. (distichous), monœcious fls. without petals, and fr. a berry or caps.

Two species are grown in warm climates for the edible fruits which are made into preserves and a few others under glass. Propagated by seeds, greenwood cuttings and *P. Emblica* by layers.

acidus (*P. distichus. Cicca disticha*). Otaheite-Gooseberry. Gooseberry-Tree. Tree to 20 ft.: lvs. ovate, to 3 in. long, distichously arranged: fls. very small, reddish, in many-fld. panicles: frs. angled, to ¾ in. across. S. Asia; nat. in S. Fla. and W. Indies.

angustifolius: *Xylophylla angustifolia.*

calycinus. Shrub to 2 ft., glabrous: lvs. oblong, to ¾ in. long, very obtuse: fls. small, pink edged with white. Australia.

distichus: *P. acidus.*

Emblica. Emblic. Myrobalan. Shrub or tree to 30 ft.: lvs. linear-oblong, to ¾ in. long, distichously arranged: fls. small, yellow, clustered in the axils of the lvs.: fr. somewhat lobed, to 1 in. across. Trop. Asia.

latifolius: *Xylophylla speciosa.*

mimosæfolius of cult. with us is *P. mimosoides.*

mimosoides. Shrub with rusty-scaly branches and abundant fine and ornamental foliage: lvs. oblong and mucronate, about ¼–⅓ in. long on two sides of slender branchlets like pinnate foliage, whitish underneath:

fls. very small, axillary, slender-pedicelled. Farther W. Indies.—Sometimes grown under glass.

nivosus: *Breynia nivosa*.

speciosus: *Xylophylla speciosa*.

PHYLLAUREA: *Codiæum*.

PHYLLITIS. *Polypodiaceæ*. A small group of mostly temp. region ferns with simple strap-shaped lvs. and long sori at right angles to midrib, one of them known in cult. in the open. See *Ferns*.

Scolopendrium (*Scolopendrium vulgare*). Harts-tongue-Fern. Hardy: lvs. straight or curved, to 1½ ft. long and 3 in. wide, entire or sometimes wavy-margined. Eu.; native in a few scattered localities in E. N. Amer.—There are many cristate, divided, crisped and dwarf forms known to fanciers, grown in the open; they are of simple cultural requirements.

PHYLLOCACTUS. *Cactaceæ*. The proper name for this genus is Epiphyllum (which see), and the plant formerly known as Epiphyllum (Crab or Christmas cactus) is Zygocactus. The plant in cult. as *P. latifrons* is *Epiphyllum oxypetalum*, and *P. biformis* is *Disocactus biformis*.

PHYLLOCLADUS. *Taxaceæ*. Evergreen trees and shrubs of 6 species in the southern hemisphere: true lvs. reduced to scales, the branchlets flattened into leathery leaf-like bodies or cladodes which are toothed or lobed: male fls. in clusters at tips of branches, female borne on cladodes. For cult. see *Conifers*; grown in Calif.

rhomboidalis. Tree to 60 ft. or shrub: cladodes triangular or rhomboid. Tasmania.

trichomanoides. Tree to 70 ft.: cladodes triangular, lobed or pinnately cut. New Zeal.

PHYLLODIUM: expanded leaf-like petiole and no blade, as in some acacias and other plants; young plants and shoots often show leaflets on such phyllodia.

PHYLLODOCE. *Ericaceæ*. Evergreen very low heath-like shrublets with prostrate or ascending branches, small linear lvs., bell-shaped or urn-shaped nodding fls. in terminal umbels, and capsular frs.; suitable for the rock-garden where they thrive in moist peaty soil. Propagated by seeds, cuttings or layers.

Breweri (*Bryanthus Breweri*). To 1 ft.: fls. rose-purple, ⅓ in. long, corolla divided to middle, stamens exserted. Mts. of Calif.

cærulea (*Andromeda cærulea*). To 6 in. high, with ascending branchlets: fls. pink or purple, about ⅓ in. long, corolla urn-shaped, stamens included. Circumpolar; south to Me., N. H. and Alta.

PHYLLOSTACHYS. *Gramineæ*. Tall shrubs with sts. flattened on one side, deciduous lf.-sheaths, tessellated lvs. and spikelets borne in terminal panicles, stamens 3; native in Asia. See *Bamboo*.

aurea (*Bambusa aurea*). Golden Bamboo. To 15 ft., sts. yellow: lvs. to 5 in. long and ¾ in. wide, long-pointed, glabrous, glaucous beneath; sheaths bristly at apex. China, Japan.

bambusoides: *P. reticulata*.

Boryana: *P. puberula* var.

Castillonis: *P. reticulata* var.

edulis: *P. pubescens*.

flexuosa (*Bambusa flexuosa*). To 18 ft., sts. becoming nearly black, branches flexuose: lvs. to 4 in. long and ½ in. across, glaucous beneath. China.

Henonis: *P. puberula*.

kumasasa (*P. ruscifolia. P. viminalis. Bambusa kumasaca. B. viminalis*). To 6 ft., sts. much flattened: lvs. to 5 in. long and 1 in. wide, shining above, slightly glaucous beneath. Japan.

marliacea: *P. reticulata* var.

mitis (*Bambusa mitis*). Moso Bamboo. To 25 ft., sts. yellow: lvs. to 5 in. long and ¾ in. wide, glaucous beneath, lf.-sheaths with bristles at apex. China, Japan.

Nevinii. Sts. pale green: lvs. linear-oblong, shining above, rough on edges. China.

nigra (*P. puberula* var. *nigra. Bambusa nigra*). Blackjoint Bamboo. To 25 ft., sts. becoming black, nodes with lower edge white: lvs. to 4 in. long and ½ in. wide, glaucous beneath. China, Japan. Var. **punctata** has yellow sts. dotted with black.

puberula (*P.* and *Bambusa Henonis*). To 15 ft., sts. bright green: lvs. to 4 in. long and ½ in. wide, toothed, shining above, glaucous beneath. China. Var. **Boryana** (*P. Boryana*) has yellow sts. spotted with purplish-brown.

pubescens (*P. edulis*). To 100 ft., sts. bright green: lvs. to 4 in. long and ⅓ in. wide, toothed. China.—The young turions are said to be edible.

Quilioi: *P. reticulata*.

reticulata (*P. bambusoides. P. Quilioi*). To 45 ft., sts. bright green, st.-sheaths mottled purple: lvs. to 6 in. long and 1 in. wide, glaucous beneath. China. Var. **Castillonis** (*P.* and *Bambusa Castillonis*) has yellow sts. striped green and lvs. striped with yellow. Var. **marliacea** (*P. marliacea*) has wrinkled sts. and dark green st.-sheaths.

ruscifolia: *P. kumasasa*.

sulphurea (*Bambusa sulphurea* and *striata*). Similar to *P. mitis* and perhaps a form of it with yellow sts. China, Japan.

viminalis: *P. kumasasa*.

violescens (*Bambusa violescens*). To 12 ft., sts. turning from violet to yellowish-brown, st.-sheaths violet: lvs. to 6 in. long and 1½ in. wide, toothed, glaucous beneath, petiole purple. China.

viridi-glaucescens (*Bambusa viridi-glaucescens*). To 25 ft., sts. yellowish-green, st.-sheaths striped purple: lvs. to 4 in. long and ¾ in. wide, glaucous beneath, lf.-sheaths purplish with bristly tips. China.

PHYLLOTÆNIUM: *Xanthosoma Lindeni*.

PHYMATODES: *Polypodium*.

PHYMOSIA: *Sphæralcea*.

PHYSALIS. Husk-Tomato. Ground-Cherry. *Solanaceæ*. Summer-flowering herbaceous annuals and perennials, sometimes slightly woody at base, straggling, diffuse or creeping: lvs. alternate, often 2 together: fls. usually axillary, blue, yellowish or whitish, not showy, the calyx becoming large and bladder-like and inclosing the globular yellow or greenish 2-celled berry, the corolla wheel- or bell-shaped; grown for ornament and some of them for the edible frs. used in preserves and pickles.

Most cultivated species of physalis need a warm sunny exposure. Since they are long-season plants and the high colors of the calyx in the ornamental species do not develop until the fruit is ripe, the seed should be sown early in the spring indoors or in a hotbed. The perennials may be propagated by division of the rhizomes or by soft cuttings.

Alkekengi (*P. Bunyardi. P. Francheti*). Alkekengi. Winter-Cherry. Chinese Lantern-Plant. Per. but often grown as ann., to 2 ft., with long creeping underground sts.: lvs. ovate, to 3 in. long, ciliate: fls. whitish: fr. with blood-red inflated calyx about 2 in. long. S. E. Eu. to Japan.—Grown for ornament.

Bunyardi: *P. Alkekengi*.

edulis: the plant listed may be either *P. ixocarpa* or *P. peruviana*.

Francheti: *P. Alkekengi*.

ixocarpa. Tomatillo. Ann. to 4 ft.: lvs. ovate, to 3 in. long, toothed or notched: fls. ¾ in. across, bright yellow, the throat with 5 black-brown spots: fr. with inflated purple-veined calyx, 1 in. or more long, entirely filled by the round sticky purplish berry. Mex.; intro. N.

lobata: *Quincula lobata.*

peruviana. Cape-Gooseberry. Partially erect, to 3 ft.: lvs. evenly cordate-ovate, soft-pubescent, often not toothed: fls. ½ in. long, light yellow marked inside with purple, anthers purple: fr. with inflated long-pointed calyx inclosing the yellow edible berry. Tropics.

philadelphica: probably *P. subglabrata.*

pruinosa. Strawberry-Tomato. Dwarf Cape-Gooseberry. Stout ann. with angled sts., more or less erect but becoming diffuse, gray-pubescent: lvs. ovate, subcordate but oblique at base, to 4 in. long, coarsely obtuse-toothed to the base: fls. buff-yellow, anthers sometimes tinged purple: fr. yellow or nearly so, edible, in a large pubescent calyx. Mass. to Fla. and west.—Apparently the common husk-tomato of gardens.

pubescens. Differs from preceding in being more slender and less erect, less pubescent or nearly glabrous, lvs. not toothed to base and mostly narrower and usually nearly entire. Pa. to Calif. and tropics.—The common husk-tomato of gardens was formerly considered to be of this species but how much if any of it belongs here is yet to be determined.

subglabrata. Per. to 5 ft.: lvs. ovate or ovate-lanceolate, to 4 in. long, oblique at base, entire or wavy: fls. yellow with purplish throat, to 1 in. across, anthers purplish: fr. with inflated calyx inclosing the red or purple berry. Ont. to Ga. and Colo.

PHYSALODES: *Nicandra.*

PHYSIANTHUS ALBENS: *Araujia sericofera.*

PHYSIC, INDIAN: *Gillenia trifoliata.* **-Nut:** *Jatropha Curcas.*

PHYSOCARPUS (*Opulaster*). Ninebark. *Rosaceæ.* Deciduous spirea-like shrubs, hardy N., with alternate toothed or lobed lvs., white or pinkish fls. in umbel-like clusters, and fr. an inflated pod or follicle; native in N. Amer. and N. E. Asia. Hardy in the N. and of easy cult. Propagated by seeds and cuttings of young or old wood.

bracteatus. To 6 ft.: lvs. broad-ovate, to 3 in. long: infl. many-fld.: pods 2, united half their length, pubescent. Colo.

capitatus (*Spiræa capitata*). Branches partially climbing, to 20 ft. long: lvs. broad-ovate, to 2½ in. long, 3–5-lobed: infl. dense: pods usually 5, glabrous. B. C. to Calif.

intermedius (*P. Ramaleyi*). To 5 ft.: lvs. ovate, to 2½ in. long: infl. many-fld.: pods 3–4, united at base, pubescent. Ont. to Colo. Var. **parvifolius** has smaller lvs. and fls.

monogynus. To 3 ft.: lvs. broad-ovate, to 1¼ in. long: infl. few-fld.: pods usually 2, united to about middle, pubescent. S. D. to New Mex.

opulifolius (*Spiræa opulifolia*). To 10 ft.: lvs. ovate, to 3 in. long: infl. many-fld., to 2 in. across: pods usually 5, glabrous. Que. to Va. and Tenn. Var. **luteus** (var *aureus*) has bright yellow lvs. becoming bronzy. Var. **nanus** is dwarf with smaller lvs.

Ramaleyi: *P. intermedius.*

tibetica: presumably *Neillia thibetica.*

PHYSOSIPHON. *Orchidaceæ.* Trop. American epiphytes with creeping rootstocks bearing 1 lf. and small fls. in racemes, the sepals united into a bell-shaped tube, inclosing the small petals and lip; grown in the cool greenhouse. For cult. see *Orchids.*

Loddigesii: *P. tubatus.*

tubatus (*P. Loddigesii*). To 10 in.: lvs. to 4 in. long: fls. green tipped with yellow-brown, about ½ in. long, in 15–20-fld. racemes, Mar.–May. Mex., Guatemala.

PHYSOSTEGIA. False Dragonhead. *Labiatæ.* Hardy per. herbs with slender often wand-like sts. and panicled spikes of gaping fls. in purple, rose or white, whorls 2-fld.; corolla-tube inflated toward the top.

These ornamentals are useful in borders and in wild-gardens and easily cultivated. Propagated usually by division of strong clumps, also grown from seed.

grandiflora: *P. virginiana* var.

speciosa: *P. virginiana* var.

virginiana (*P. virginica. Dracocephalum virginianum*). To 4 ft.: lvs. oblong or lanceolate, to 5 in. long, toothed: fls. purplish-red to rose-pink or lilac, to 1 in. long, in spikes to 8 in long, in summer. Que. to Fla. and Tex. Var. **alba**, fls. white; **gigantea**, to 7 ft.; **grandiflora**, fls. bright pink; **speciosa**, spikes densely panicled.

PHYTELEPHAS. *Palmaceæ.* Acaulescent or short-trunked feather-lvd. diœcious unarmed palms of several species in northwestern S. Amer.: spadices from lf.-axils and mostly near the ground; staminate spadix a long catkin, the prominent stamens numerous; pistillate spadix comprising a more or less dense head of large fls., the ovary with several cells: fr. a syncarp of several united berry-like parts. See *Palm.*

macrocarpa. Ivory-Nut Palm. Trunk to 2 ft. long, often or mostly declined or prostrate (or becoming so) and rooting: lvs. very long, erect-curving, to 20 ft. or more; pinnæ about 80 pairs, main ones 2–3 ft. long and 2 in. or less broad, strongly many-nerved, rather stiff: fr.-heads sometimes weigh 25 lbs., and supply "vegetable ivory." Colombia, Ecuador; thrives in S. Fla.

PHYTEUMA. Horned Rampion. *Campanulaceæ.* Per. herbs with alternate and radical simple lvs., 5-parted blue, purplish or white fls. in terminal heads or spikes, and capsular frs.; fl.-buds mostly long curved and horn-like and fls. not opening widely; native in Eu. and Asia.

Phyteumas are grown mostly in rock-gardens where they succeed in any good soil, and the larger ones in borders. Propagated by seeds or division in spring.

canescens. To 3 ft., gray-pubescent and rough: lvs. ovate to lanceolate, toothed: fls. blue, in loose spikes. E. Eu., W. Asia.

Charmelii. To 1 ft.: lvs. oval to lanceolate, toothed: fls. dark blue, in globular heads. Alps.

comosum. To 6 in. decumbent: lvs. cordate-ovate to lanceolate, coarsely toothed: fls. dark purple, lilac below, the corolla-lobes united into tube above around the long-exserted style, borne in umbels. Alps.

Halleri. To 2½ ft.: lvs. ovate or orbicular, coarsely toothed: fls. dark violet or white, in dense oblong spikes subtended by 2 long drooping bracts. Eu.

hemisphæricum. To 6 in., tufted: lvs. linear or linear-lanceolate, entire: fls. blue or sometimes whitish, in 12–15-fld. oval heads. Alps.

lobelioides. To 2 ft.: lvs. narrow-lanceolate, wavy-toothed: fls. in loose spike-like racemes. Asia Minor.

Michelii. To 2 ft.: lvs. lanceolate to linear, lower long-stalked: fls. violet, rarely white, in dense oblong heads. S. Eu.

nigrum. To 1 ft.: basal lvs. heart-shaped, toothed, long-stalked, st.-lvs. linear: fls. dark blue, in oblong dense heads. Eu.

orbiculare. To 2 ft.: lvs. ovate to linear, toothed: fls. purple, in many-fld. globose heads. Eu.

Scheuchzeri. To 1½ ft.: lvs. oblong to lanceolate, toothed: fls. violet-blue, in dense globose heads 1 in. across subtended by long narrow bracts. S. Eu.

Sieberi. To 6 in.: lvs. ovate to lanceolate, toothed: fls. deep blue. in 12–15-fld. globose heads. S. Eu.

spicatum. To 4 ft.: lvs. ovate to linear, toothed, the basal long-stalked: fls. white with greenish tips, in dense oblong spikes. Eu.

Vagneri. Lvs. irregularly toothed, lower long-petioled and cordate at base, upper sessile, linear or linear-lanceolate: fls. dark violet, in globose spikes becoming elongated. Hungary.

PHYTOLACCA. Pokeweed. Pokeberry. *Phytolaccaceæ.* Herbs, shrubs or trees with alternate simple lvs., small fls. in terminal racemes, and fr. a fleshy berry with staining juice; grown for ornament and *P. esculenta* as a pot-herb in some countries. Of easy cult. Propagated by seeds.

americana (*P. decandra*). Poke. Scoke. Herb to 12 ft., strong-smelling: lvs. oblong- or ovate-lanceolate: fls. bisexual, white or purplish. Me. to Fla. and Mex.

decandra: *P. americana.*

dioica (*Pircunia dioica*). Evergreen soft-wooded tree to 60 ft. and more with thick trunk: lvs. elliptic or ovate: fls. diœcious, white. S. Amer.

esculenta (*P. Kaempferi*). Herb to 3 ft. or more, slightly woody at base: lvs. ovate, edible: fls. bisexual, white. China, Japan.

heterotepala. Shrub: lvs. ovate-elliptic: fls. bisexual, green. Cent. Amer., Mex.

Kaempferi: *P. esculenta.*

octandra. Woody herb to 2 ft.: lvs. ovate-lanceolate: fls. bisexual, pinkish-white. Cent. Amer. to Colombia.

PHYTOLACCACEÆ. Pokeweed Family. About 22 American and African genera of herbs, shrubs and trees with alternate entire lvs., regular bisexual or unisexual fls. having no petals, 4–5-parted calyx, 4–5 stamens, superior ovary, and fr. a berry, caps. or samara. Agdestis, Ercilla, Petiveria, Phytolacca and Rivina are cult.

PIAROPUS: *Eichhornia.*

PICEA. Spruce. *Pinaceæ.* Tall evergreen trees of pyramidal habit and continuing axis, native in cooler parts of northern hemisphere and hardy in cult., with linear 4-angled or compressed lvs. having white bands, catkin-like fls., and drooping cones with persistent scales, in these characters differing from the firs (Abies). For cult. see *Conifers.*

Abies (*P. excelsa*). Norway S. Branchlets usually drooping: lvs. 4-angled, to ¾ in. long, dark green and shiny: cones to 7 in. long. Eu.; one of the commonest planted evergreens in N. Amer. Some of the hort. vars. are: **argentea**, lvs. variegated with white; **argenteo-spica**, tips of young branchlets white; **aurea**, lvs. golden-yellow; **Barryi**, conical form with thick branches; **chlorocarpa**, cones green when young; **cincinnata**, lvs. long and spirally twisted; **Clanbrasiliana**, compact bush to 7 ft. with whitish branchlets; **columnaris**, of columnar habit with very short branches; **compacta**, dense nearly globose form; **conica**, of conical pyramidal habit; **cupressina**, of broad columnar form; **dumosa**, prostrate; **elegans**, of slender conical habit; **Ellwangeriana**, of broad-pyramidal form with crowded branchlets; **erythrocarpa**, cones violet-purple when young; **finedonensis**, lvs. pale yellow becoming bronzy, then green; **Gregoryana**, dwarf to 2 ft., with crowded pale branchlets; **inversa**, branches drooping, densely branched; **Maxwellii**, dwarf form to 2 ft. with very short thick branchlets; **Merkii**, low form with thin grass-green lvs.; **microsperma**, of dense bushy habit; **monstrosa**, without branches, only a single st. clothed with stiff lvs.; **mucronata**, shrub with crowded red-yellow branchlets; **nana**, dwarf, with short orange-yellow branchlets; **nidiformis**, low form with very dense head, having a nest-like mass of branchlets; **nigra**, of pyramidal densely branched habit; **Parsonsii**, straggling dwarf form with drooping branchlets; **parviformis**, of broad pyramidal habit; **pendula**, branches drooping; **procumbens**, prostrate, with horizontal bright yellow branchlets; **pumila**, dense dwarf form with lvs. bluish-green in **glauca**; **pygmæa**, dense and small; **pyramidata**, of slender pyramidal habit; **Remontii**, dense pyramidal form with crowded yellow branchlets; **tabuliformis**, prostrate, with horizontal branches; **Veitchii**, dwarf conical form; **viminalis**, branches nearly horizontal, with long slender branchlets; **virgata**, branches elongated and without branchlets. Other listed names are *erimata, robusta, Smithii, tenuifolia.*

ajanensis: *P. jezoensis.*

alba: *P. glauca.*

albertiana: *P. glauca* var.

Alcockiana: *P. bicolor.*

ascendens. Branchlets drooping: lvs. flattened, to ¾ in. long, with 2 white bands above: cones to 4 in. long. W. China; hardy N.

asperata. Lvs. 4-angled, to ⅗ in. long, dark green: cones to 4 in. long. W. China; hardy N. Var. **notabilis** has longer lvs. and cones. Var. **ponderosa** has thicker bark and larger cones.

aurantiaca. Branchlets orange: lvs. 4-angled, to ¾ in. long, sharp-pointed: cones to 5 in. long. W. China; hardy N.

Balfouriana. Lvs. 4-angled, to ⅗ in. long, with 2 white bands above: cones to 3½ in. long. W. China; hardy N. but likely to remain small.

bicolor (*P. Alcockiana*). Alcock S. Lvs. 4-angled, to ¾ in. long, with 2 white bands above: cones to 4 in. long. Japan; hardy N. Var. **acicularis** and var. **reflexa** have curved lvs. and entire cone-scales.

bifolia: *Abies lasiocarpa.*

brachytyla. Branchlets orange-yellow: lvs. flattened, to 1 in. long, white above: cones to 5 in. long. Cent. China; to be tried in north-central regions.

Breweriana. Branchlets drooping and whip-like: lvs. flattened, to 1 in. long, with white bands above: cones to 5 in. long. S. Ore., N. Calif.—A form *pygmæa* is listed.

canadensis: *P. glauca.*

complanata. Branchlets drooping, orange-brown: lvs. flattened, to nearly 1 in. long, with broad white bands above: cones to 6½ in. long. W. China.

cornuta: a listed name.

Douglasii: *Pseudotsuga taxifolia.*

Engelmanni. Lvs. 4-angled or slightly flattened, to 1 in. long, bluish-green: cones to 3 in. long. B. C. to New Mex.; one of the hardiest. Var. **argentea** has silvery-gray lvs. and var. **glauca** steel-blue. Var. **Fendleri** has drooping branchlets and longer lvs.

excelsa: *P. Abies.*

glauca (*P. canadensis. P. alba*). White S. Branchlets commonly drooping: lvs. 4-angled, to ¾ in. long, bluish-green: cones to 2 in. long. Across Canada and in N. U. S. Var. **albertiana** (*P. albertiana*), lvs. more crowded, cones shorter, B. C. to Mont. Var. **aurea**, lvs. golden-yellow. Var. **cærulea**, lvs. glaucous. Var. **conica**, dwarf narrowly conical form. Var. **nana**, dwarf and dense.

Glehnii. Saghalin S. Lvs. 4-angled, to ½ in. long, deep green: cones to 3 in. long. Japan, Saghalin; very hardy.

heterolepis. Lvs. 4-angled, to ¾ in. long, spiny-pointed, bluish-green: cones to 6 in. long. W. China; hardy N.

hondoensis: *P. jezoensis* var.

hudsonia: *Abies Fraseri.*

jezoensis (*P.* and *Abies ajanensis*). Yeddo S. Lvs. flattened, to ¾ in. long, silvery-white above, glossy dark green below: cones to 3½ in. long. N. Asia, Japan; hardy N. Var. **hondoensis** (*P. hondoensis*) has shorter lvs. dull green below.

Koyamai. Lvs 4-angled, to ½ in. long, with 2 white bands above: cones to 4 in. long. Japan; hardy N.

likiangensis. Branchlets pale yellow: lvs. 4-angled, with white bands above: cones to 3½ in. long. W. China.

mariana (*P. nigra*). Black S. Lvs. 4-angled, to ¾ in. long, dull or bluish-green: cones to 1½ in. long. Alaska and northern states to mts. of Va. Some of the hort. vars., are: **Beissneriana**, pyramidal form with light bluish-green lvs.; **Doumetii**, of dense pyramidal habit; **ericoides**, slow-growing conical form with very thin lvs.; **fastigiata,** of columnar habit; **nana,** dwarf form.

Maximowiczii. Japanese Bush S. Lvs. 4-angled, spreading radially, to ½ in. long, dark green and stiff: cones to 2½ in. long. Japan; hardy N.

Meyeri. Lvs. 4-angled, to ¾ in. long, bluish-green: cones to 3 in. long. N. China; hardy N.

montigena. Lvs. 4-angled, to ½ in. long, with 2 white bands above: cones to 4 in. long. W. China; hardy N.

Morinda: *P. Smithiana.*

morrisonicola. Lvs. 4-angled, to ¾ in. long, dark green: cones to 2½ in. long. Formosa.

Moseri. Hybrid between *P. jezoensis* and *P. mariana.*

nigra: *P. mariana.*

obovata (*Abies obovata*). Siberian S. Branchlets slightly drooping: lvs. 4-angled, to ¾ in. long, dull or bluish-green: cones to 2½ in. long. N. Eu., N. Asia; very hardy. Var. **alpestris,** slow-growing form with larger cones. Var. **fennica,** lvs. dark green.

Omorika (*Abies Omorika*). Servian S. Lvs. flattened, to ½ in. long, with 2 white bands above and glossy dark green below: cones to 2½ in. long. S. Eu.; hardy N., but requires shelter from winter winds to be at its best.

orientalis. Branchlets slightly drooping: lvs. 4-angled, to ½ in. long, crowded, glossy dark green: cones to 3½ in. long. Caucasus, Asia Minor; hardy in Cent. New England but does best in sheltered positions. Var. **aurea,** lvs. bronzy-golden. Var. **aureo-spicata,** lvs. yellow when young. Var. **nana** (var. *compacta*), low with wide-spreading branches.

Parryana: synonym of *P. pungens.*

polita. Tigertail S. Lvs. 4-angled, to 1 in. long, spreading radially, stiff, glossy dark green: cones to 5 in. long. Japan; hardy N.

pungens. Colorado S. Lvs. 4-angled, to 1¼ in. long, spreading radially, stiff and spiny-pointed, usually bluish-green: cones to 4 in. long. Colo., Wyo., Utah, New Mex.; very hardy. Hort. vars. are: **argentea,** lvs. silvery-white; **aurea,** lvs. golden-yellow; **cærulea,** lvs. bluish-white; **compacta,** dwarf and compact; **glauca,** lvs. bluish; **Hunnewelliana,** dense dwarf form; **Kosteriana** (var. *glauca pendula*), branchlets drooping, lvs. bluish; **viridis,** lvs. green.

purpurea. Branchlets orange-yellow: lvs. 4-angled, to ½ in. long, with 2 white bands above and green below: cones to 2½ in. long, purple. W. China; hardy N. in special locations.

retroflexa. Branchlets bright yellow: lvs. 4-angled, to 1 in. long: cones to 5 in. long. W. China.

rubra (*Abies rubra*). Red S. Lvs. 4-angled, ½ in. long, dark or bright green: cones to 2 in. long. N. S. to mts. of N. C. Var. **virgata** has long slender branches without branchlets.

Sargentiana. Branchlets orange to pale yellow: lvs. flattened, to ½ in. long, with 2 white bands above and glossy green beneath: cones to 5 in. long. W. China; hardy N.

Schrenkiana. Branchlets drooping: lvs. 4-angled, to 1½ in. long, radially spreading, dull green: cones to 4 in. long. Cent. Asia; hardy in S. New England. There is a var. **glauca.**

sitchensis. Sitka S. Lvs. flattened, to 1 in. long, spiny-pointed, silvery-white above, glossy green below: cones to 4 in. long. Alaska to Calif., can be grown in central states and S. New England, best in long dry summers. Var. **speciosa** is more compact and slower-growing.

Smithiana (*P. Morinda*). Himalayan S. Branchlets drooping: lvs. 4-angled, to 2 in. long, spreading radially, bright or dark green: cones to 7 in. long. Himalayas; can be grown in north central Atlantic states and in S. New England in sheltered positions.

spinulosa. Branchlets drooping: lvs. slightly flattened, to 1½ in. long, with 2 glaucous bands above: cones to 4 in. long. Himalayas; to be planted far S.

Watsoniana. Lvs. 4-angled, to ¾ in. long, dark green: cones to 2 in. long. China; hardy in S. New England.

Wilsoni. Lvs. 4-angled, ½ in. long, sharp-pointed, dark green: cones to 2½ in. long. Cent. China; hardy N.

PICKEREL-WEED: *Pontederia cordata.*

PICOTEE: *Dianthus Caryophyllus.*

PICRIDIUM VULGARE: *Reichardia picroides.*

PICRIS. *Compositæ.* Hairy ann. or per. herbs native in temp. regions of the Old World, with alternate toothed lvs. and heads of yellow ligulate fls. borne in corymbs; pappus of white bristles. Sometimes seen in the flower-garden.

echioides. Ann. to 2 ft., with appearance of Sonchus: lvs. oblong-lanceolate, wavy-toothed, covered with bristly hairs: heads ½ in. long. Eu., N. Afr.

PIE-PLANT: *Rheum Rhaponticum.*

PIERIS. *Ericaceæ.* Evergreen shrubs or small trees with mostly alternate toothed lvs., white urn-shaped fls. in terminal panicles, and dry capsular frs.

Pierises require moist peaty or sandy soil and partial shade. They are sometimes forced under glass. Propagated by seeds, by layers, and cuttings of ripe wood under glass which root slowly. The following (except the last) are hardy North.

floribunda (*Andromeda floribunda*). To 6 ft., the branches hairy: lvs. ciliate: fls. ¼ in. long, in erect panicles to 5 in. long, Apr.–May. Va. to Ga.

japonica (*Andromeda japonica*). To 10 ft. or more, the branches glabrous: fls. ⅓ in. long, in drooping panicles to 6 in. long, Apr.–May. Japan. Var. **variegata** (var. *albo-marginata*), lvs. with whitish margins.

lucida: *Lyonia lucida.*

mariana: *Lyonia mariana.*

nitida: *Lyonia lucida.*

taiwanensis. Branches glabrous: fls. ¼ in. long, nodding, in dense panicled racemes to 2½ in. long. Formosa.

PIGEON-BERRY: *Duranta repens.*

PIGNUT: *Carya glabra.*

PIGWEED: *Chenopodium.*

PILEA (*Adicea*). *Urticaceæ.* Mostly trop. herbs with opposite lvs. and small unisexual fls. in axillary clusters; grown as pot-plants or for edgings in greenhouses or out-of-doors in the S. for the compact habit and small foliage. Of easy cult. but require abundant moisture. Propagated by cuttings.

microphylla (*P. serpyllifolia*). Artillery Plant. Ann. or bien., the fleshy sts. prostrate or to 1 ft. and more high: lvs. oblong, of unequal size, to ¼ in. long, entire: staminate fls. discharging pollen forcibly when dry. Trop. Amer., S. Fla.

nummulariæfolia. Creeping Charley. Per. with creeping sts. rooting at nodes: lvs. orbicular, to ¾ in. across, crenate. W. Indies.

serpyllifolia: *P. microphylla.*

PILOCEREUS. *Cactaceæ.* The older and accepted name for this genus is Cephalocereus, which see. The plant commonly known as *P. senilis*, or Old Man Cactus, is *Cephalocereus senilis.*

PILOGYNE: *Melothria punctata.*

PIMELEA (*Banksia* of some writers). Rice-Flower. *Thymelæaceæ.* Shrubs native in Australia and New Zeal., with simple entire lvs., white, pink or reddish fls. in terminal heads, bisexual or diœcious, fr. a drupe.

Pimelias are grown out-of-doors in warm climates and in the greenhouse. Propagated in early spring by cuttings of half-ripened shoots under glass in a temperature of 55–60°.

decussata: *P. ferruginea.*

ferruginea (*P. decussata*). To 3 ft.: lvs. opposite and crowded, ovate or oblong, to ½ in. long, margins revolute: fls. rose, in round heads which are subtended by pink or red involucral lvs. or sometimes only tinged. W. Australia.

graciliflora. To 2½ ft.: lvs. opposite, lanceolate, to ¾ in. long, dotted above: fls. white, in globular heads. W. Australia.

ligustrina. To 6 ft.: lvs. opposite, ovate or oblong, to 1½ in. or more long: fls. white, in globular heads. Australia, Tasmania.

spectabilis. To 4 ft.: lvs. opposite and crowded, linear-oblong to lanceolate, to 1½ in. long: fls. white or pinkish, in large globular heads subtended by involucral lvs. tinged on margins. W. Australia.

PIMENTA. *Myrtaceæ.* Trop. American aromatic trees with opposite simple leathery lvs., small fls. in cymes, and drupaceous fr.; one species furnishes allspice and another grown for the oil which is used in the preparation of bay-rum. Adapted to trop. climates.

acris (*Amomis caryophyllata*). Bay-Rum-Tree. To 45 ft.: lvs. elliptic to obovate, to 6 in. long: fls. white; calyx 5-lobed: fr. about ⅓ in. long. W. Indies, S.

officinalis. Allspice. Pimento. To 40 ft.: lvs. oblong, to 7 in. long: fls. white; calyx 4-lobed: fr. dark brown, ¼ in. long. W. Indies, Cent. Amer.

PIMENTO: from Spanish *pimiento*, pepper; in U. S. applied as a general term to Capsicum, and sometimes to a specific cult. variety.

PIMPERNEL: *Anagallis.*

PIMPINELLA. *Umbelliferæ.* Herbs with pinnately compound lvs., small white or yellow fls. in compound umbels, and ovate frs.; one species cult., for its use in medicine and cookery. Propagated by seeds sown where plants are to stand.

Anisum. Anise. Ann. to 2 ft.: basal lvs. simple or ternate, st.-lvs. 1–2-pinnate or ternate, entire or toothed. Greece to Egypt.

PINACEÆ. Pine Family. Thirty or more genera of resinous trees and shrubs widely distributed, having linear, needle- or scale-like lvs., fls. in cones, and fr. a hard woody cone or sometimes berry-like. The family was established by Lindley in 1847; but with the Taxaceæ and Ginkgoaceæ it had been included for a generation or more in the family Coniferæ, constituting the gymnosperms, a group now broken into the three parts or families. Pinaceæ is technically distinguished by the cones, formed of aggregated scales at the base of each of which a naked ovule or two is borne, becoming the seed; sometimes, as in the junipers, the scales are more or less fleshy and cohere into a firm berry-like body. See *Conifers.* In the larches and bald cypress the lvs. are deciduous, but the species as a whole are evergreen. The foliage is of many characters, from the broad flat acacia-like lvs. of Agathis to the clustered needles of pines, larches and true cedars, the flat or angled short scattered lvs. of the firs, spruces and hemlocks, the long awls of Cunninghamia and Araucaria, and the scale-like opposite or whorled lvs., more or less appressed on old growths, of junipers, arborvitæ, cryptomeria and callitris. The family contains many valuable timber trees and numerous ornamental subjects, as Abies, Actinostrobus, Agathis, Araucaria, Athrotaxis, Callitris, Cedrus, Cryptomeria, Cunninghamia, Cupressus, Fitzroya, Glyptostrobus, Juniperus, Keteleeria, Larix, Libocedrus, Picea, Pinus, Pseudolarix, Pseudotsuga, Sciadopitys, Sequoia, Taiwania, Taxodium, Tetraclinis, Thuja, Thujopsis, Tsuga, Widdringtonia.

PINANGA. *Palmaceæ.* Bamboo-like unarmed ringed monœcious feather-palms of the Indo-Malayan region, 60 or more species: trunks solitary or plant gregarious or colonizing: pinnæ mostly short, often broad, sometimes truncate and toothed at apex, upper ones mostly confluent: spadices among the lvs., short, commonly with few or several strands from the base; fls. in 3's, the middle one pistillate; stamens 6 or more: fr. small, ovoid or ellipsoidal. Sometimes grown under glass and to be expected in S. Fla. See *Palm.*

decora. St. tall: lvs. arching and graceful; pinnæ of mature lvs. apparently 2 pairs, broadly lanceolate and gradually acuminate, strongly several-nerved. Borneo.—Described from juvenile plants and character doubtful; perhaps two palms have passed under this name.

Kuhlii. Attractive plant because of the neat tufted habit and coral-red refracted spadices: sts. several, to 30 ft., many-ringed: lvs. 3–4 ft. long, pliable; pinnæ 3–6 pairs, 1–2 ft. long and to 3 in. broad, strongly several-ribbed, the upper ones truncate and toothed, the lower sharply acuminate; spadix 1 ft. long, of several branches: fr. nearly ½ in. long. S. Andaman Isls., Sumatra, Java.

patula. Plant colonizing: st. solitary, 6 ft. or more, ringed and smooth: lvs. 4–5 ft. long; pinnæ strongly several-nerved, 16–36, the lower and middle ones 6–12 in. long and long-acuminate and 1–2 in. broad, the upper ones broader and confluent and truncate and toothed at apex: spadices on the trunk below the lvs., short-peduncled, with several rather stout branches: fr. ellipsoid, orange-red, ⅔ in. long. Sumatra.

PINCUSHION-FLOWER: *Scabiosa.*

PINE: *Pinus.* **Australian-:** *Casuarina.* **-Barren Beauty:** *Pyxidanthera barbulata.* **Cypress-:** *Callitris.* **Dammar-:** *Agathis.* **Ground-:** *Lycopodium obscurum.* **Hoop-:** *Araucaria Cunninghamii.* **Huon-:** *Dacrydium Franklinii.* **Kauri-:** *Agathis australis.* **Norfolk-Island-:** *Araucaria excelsa.* **Running-:** *Lycopodium clavatum.* **Screw-:** *Pandanus.* **Umbrella-:** *Sciadopitys verticillata.*

PINEAPPLE. Although a tropical fruit, the pineapple, *Ananas sativus* (*A. comosus*), has been grown some distance outside the tropics. Some years ago, along the east coast of Florida, its culture on a very considerable scale was conducted in the open and under slat sheds as far north as 27.5°. In other parts of that state, as in Lee, Orange and Pinellas counties it was grown to some extent under sheds. At one time the crop was in excess of a half million crates annually, but now the pineapple, as a commercial fruit, has almost disappeared from Florida. This was brought about by a combination of circumstances, among which may be mentioned diseases (in particular, a wilt caused by nematodes), a succession of cold winters, high freight rates, and the development of its culture elsewhere, particularly in Cuba, Porto Rico and Hawaii. At present most of the fresh fruit entering the markets of the eastern United States comes from Cuba and Porto Rico. The western states are supplied with fresh fruit from Hawaii and the canned fruit trade is furnished almost entirely with large quantities from the Hawaiian fields. The largest areas are in Hawaii where 75 per cent of the world's crop is produced. Much of the product is canned.

Commercial propagation of pineapple is by means of (1) ratoons, or suckers, that come from the base of the old fruiting stem, (2) stem slips developed along the trunk or stem of matured plants, and (3) fruit slips, produced around the base of the fruit. The crown, or leafy part on top of the fruit, will also produce a plant, but it is slow in coming into fruit and it is not employed in commercial plantings. Plants will also develop from old stems if they are cut up and partially buried in the earth.

The exact nature or character of the soil is not important. It may vary from light sand to heavy clay. It is important, however, that it be thoroughly well drained, for although the pineapple requires abundant water for its development, it will not grow where the drainage is poor and water stagnates. In some localities lime and manganese have caused trouble. The difficulties due to the presence of manganese have been overcome by using iron sulfate spray.

Pineapples are planted in beds of two or more rows. In Hawaii the two-row system is largely used in planting Smooth Cayenne, while beds with a larger number of rows are preferred in the West Indies for smaller-fruited varieties. The number of slips to the acre will vary from 7,500 to 15,000 depending on the distance apart they are set and the number of rows to each bed. The usual distances apart for the plants vary from 18 to 24 inches. Slips are set just deep enough to keep them in an upright position. On light soils it is usual to drop a small amount of cottonseed-meal into the centers of the plants. This forms a cake and prevents their being filled with sand.

Tillage must be shallow (an inch or so) inasmuch as pineapple roots are near the surface. The favorite tool is the scuffle hoe with which shallow cultivation and weed destruction are readily accomplished. Old plantations are not cultivated. In Hawaii mulching with special paper has come into considerable use.

The extent to which fertilizers are used will depend on the nature of the soil, the number of plants set to an acre, and the age of the plantation. On light sandy soils fertilizers are applied in large quantities, a ton or more to the acre being not unusual. Applications are usually made in October, February and June. Tankage and dried blood are good sources of nitrogen, potash may be furnished from high or low grade sulfate of potash, and phosphoric acid from ground bone, raw or steamed. An analysis of 4 per cent ammonia, 10 per cent potash, 8 per cent phosphoric acid is a usual requirement. The use of kainit and acid phosphate should be avoided.

If intended for shipment to distant points pineapples are commonly picked a week or so before reaching full maturity. If intended for local consumption or for canning at nearby establishments they may be allowed to become much riper, thereby developing their full delicious flavor. There is perhaps no more luscious fruit than a well-grown field-ripened pineapple. For shipment, fruits are wrapped in paper and packed in crates, in rows, the crowns and bases alternating. The superior varieties are packed in cases with excelsior.

Although mostly free from insect and disease troubles, pineapples are sometimes subject to attack by pests. In dry seasons red-spider is occasionally troublesome. Mealybugs also attack the leaves, particularly near their bases. Both may be controlled by dusting with a mixture of eight parts of dusting sulfur and two parts nicotine sulfate dust. Nematodes are often troublesome. They are best handled by rotating the crop, and planting crotalaria or Natal-grass to starve them out. Several soil and fertilizer troubles may arise, but these can usually be overcome without much difficulty.

Varieties of pineapples in commercial plantings have never been great in number when compared with other fruits. In Hawaii the favorite is Smooth Cayenne and this has been the most important fancy variety in other parts of the world. In Florida in years past, and in the West Indies now, the most important variety by far is Red Spanish. Here and there other varieties, Porto Rico for example, a very large kind, and Abbaka a small fruit of very high quality, are seen. Into commercial plantings today only two varieties, Smooth Cayenne and Red Spanish, enter to any extent.

PINEAPPLE-FLOWER: *Eucomis punctata.*

PINGUICULA. BUTTERWORT. *Lentibulariaceæ.* Stemless herbs with basal entire lvs. covered above with a sticky secretion on which insects adhere, white, purple or yellow fls. solitary on a scape, the corolla 2-lipped and spurred at base, and capsular frs.; of wide distribution in moist ground.

Butterworts are grown mostly on rocks or in moist rock-gardens. Propagated by seeds and offsets when produced.

australis: *P. elatior.*

elatior (*P. australis*). To 1 ft.: lvs. to 1½ in. long: fls. purple varying to white, 1 in. across, the lobes 2-parted. N. C. to Fla.

grandiflora. To 8 in.: lvs. oval: fls. violet, 1 in. long and ¾ in. across, the lobes wavy. W. Eu.

lutea. To 1 ft.: lvs. ovate, to 2½ in. long: fls. golden-yellow, to 1½ in. long and broad, with nearly regular corolla-limb. N. C. to Fla. and La.

vulgaris. To 6 in.: lvs. ovate, to 1½ in. long: fls. violet or purple, ½ in. long and broad. N. N. Amer., Eu., Asia.

PINGUIN: *Bromelia Pinguin.*

PINK: *Dianthus.* **Cushion:** *Silene acaulis.* **Fire:** *Silene virginica.* **Ground-:** *Phlox subulata.* **Indian:** *Silene laciniata, Lobelia cardinalis.* **Moss-:** *Phlox* *subulata.* Mullein-: *Lychnis coronaria.* -Root: *Spigelia marilandica.* Sea-: *Limonium, Statice.* -Shower: *Cassia grandis.* Swamp-: *Helonias bullata.* -Vine: *Antigonon leptopus.* Wild: *Silene caroliniana.*

PINNA: a primary division or leaflet of a pinnate leaf.

PINNATE: feather-formed; with the leaflets of a compound leaf placed on either side of the continuing rachis.

PINNATIFID: cleft or parted in a pinnate (rather than palmate) way.

PINNATISECT: cut down to the midrib in a pinnate way.

PINNULE: a secondary pinna or leaflet in a pinnately decompound leaf.

PIÑON, PINYON: *Pinus cembroides.*

PINUS. Pine. *Pinaceæ.* Large evergreen trees having 2 kinds of lvs., the scale-like ones deciduous, the permanent lvs. linear and borne in clusters usually of 2–5, staminate fls. in catkins, and cylindric or nearly globose pistillate cones with woody scales; native in the northern hemisphere, and furnishing many valuable timber and ornamental trees, most of them adapted to large areas and extended grounds but a few dwarf and compact forms. For cult. see *Conifers.*

albicaulis. Whitebark P. Lvs. in clusters of 5, to 2½ in. long, stiff, dark green: cones ovoid, to 3 in. long. B. C. to Calif.; very hardy.

aristata. Hickory P. Bristle-Cone P. Sometimes shrubby: lvs. in clusters of 5, to 1½ in. long, dark green with whitish exudations of resin: cones cylindric-ovoid, to 3½ in. long. Calif. to Colo.; stands in S. New England but grows very slowly.

Armandi. Lvs. in clusters of 5, to 6 in. long, bright green and thin: cones oblong-conical, 6 in. and more long. China, Formosa, Korea; hardy N.

attenuata (*P. tuberculata*). Knob-Cone P. Lvs. in clusters of 3 or rarely 2, to 5 in. and more long, pale yellowish or bluish-green: cones conic-oblong, to 6 in. long. Ore. to Calif.

Ayacahuite. Mexican White P. Lvs. in clusters of 5, to 6 in. long, bluish-green: cones cylindric-conical, to 15 in. long. Mex. to Guatemala. Var. **brachyptera** has larger seeds. Var. **Veitchii** has longer cones.

Balfouriana. Foxtail P. Lvs. in clusters of 5, to 1½ in. long, stiff, dark green: cones cylindric, to 5 in. long, drooping. Calif.

Banksiana (*P. divaricata*). Jack P. Lvs. in clusters of 2, 1 in. long, stiff and twisted, bright or dark green: cones conic-oblong, to 2 in. long. N. S. to N. Y. and Minn.

brutia: *P. halepensis* var.

Bungeana. Lacebark P. Lvs. in clusters of 3, to 4 in. long, stiff, light green: cones conic-ovate, to 3 in. long. N. W. China; hardy N. but may remain bushy.

canariensis. Lvs. in clusters of 3, to 12 in long, glossy light green, drooping: cones cylindric-ovoid, to 8 in. long. Canary Isls.

caribæa. Slash P. Lvs. in clusters of 3 or 2, to 12 in. long, glossy dark green: cones conic-oblong, to 6½ in. long. S. U. S., Cent. Amer.

Cembra. Swiss Stone P. Lvs. in clusters of 5, to 5 in. long, dark green: cones ovoid, to 3½ in. long. Eu., N. Asia; hardy N., but very slow growing. Var. **columnaris** is of columnar habit. Var. **sibirica** has shorter lvs. and larger cones.

cembroides. Mexican Stone P. Piñon or Pinyon. Lvs. in 3 or 2, to 2 in. long, dark green: cones nearly globose, to 2 in. long. Ariz. to Mex.; to be planted far S. Var. **edulis** (*P. edulis*). Nut P. Lvs. stiff, dark green. Wyo. to New Mex.; apparently hardier. Var. **monophylla** (*P. monophylla. P. Fremontiana*). Lvs. usually solitary, stiff and spiny-pointed. Calif. to to Colo. Var. **Parryana** (*P. Parryana. P. quadrifolia*). Lvs. in clusters of 3–5, stiff, pale glaucous-green. Calif.

clausa. Sand P. Lvs. in clusters of 2, to 3 in. long, dark green: cones conic-ovoid, to 3½ in. long. Fla., Ala.

contorta. Shore P. Lvs. in clusters of 2, to 2 in. long, stiff and twisted, dark green: cones conic-ovoid, to 2 in. long. Alaska to Calif.; not hardy in northeastern states. Var. **latifolia** (*P. Murrayana*). Lodgepole P. Lvs. longer, lighter green. Rocky Mts.; hardy E.

Coulteri. Lvs. in clusters of 3, to 12 in. long, dark bluish-green: cones cylindric-ovoid, to 14 in. long, drooping. Calif.; can be grown in sheltered places in S. New England.

densiflora. Japanese Red P. Lvs. in clusters of 2, to 5 in. long, bright bluish-green: cones conic-ovoid to oblong, 2 in. long. Japan; hardy N., but sometimes suffers in severe winters. Hort. vars. are: **albo-terminata**, tips of lvs. yellowish-white; **aurea**, lvs. yellow; **globosa**, dwarf globose form; **oculus-draconis**, lvs. with 2 yellow bands; **pendula**, branches drooping or prostrate; **umbraculifera**, Tanyosho, dwarf form with umbrella-like head.

divaricata: *P. Banksiana.*

echinata (*P. mitis*). Shortleaf P. Lvs. in clusters of 2, to 5 in. long, dark bluish-green: cones conic-oblong, to 2 in. long. N. Y. to Fla. and Tex.

edulis: *P. cembroides* var.

excelsa. Himalayan P. Lvs. in clusters of 5, to 8 in. long, grayish- or bluish-green, drooping: cones cylindric, to 10 in. long. Himalayas; hardy in central or northern states.

flexilis. Limber P. Lvs. in clusters of 5, to 3 in. long, stiff, dark green: cones ovoid, to 6 in. long. Alta. to Calif. and Tex.; hardy N. Var. **reflexa**, taller, with longer lvs. and cones. Ariz.

Fremontiana: *P. cembroides* var. *monophylla.*

Gerardiana. Lvs. in clusters of 3, to 4 in. long, bluish-green: cones to 9 in. long. Himalayas.

glabra. Cedar P. Lvs. in clusters of 2, to 3 in. long, soft: cones ovoid, to 2½ in. long. S. C. to Fla. and La.

halepensis. Aleppo P. Lvs. in clusters of 2 or rarely 3, to 4 in. long, light green: cones conic-ovoid, to 3½ in. long. Medit. region; to be planted in mild climates. Var. **brutia** (*P. brutia. P. pyrenaica*). Lvs. longer, stiffer, darker green.

horizontalis: *P. nigra* var. *cebennensis.*

insignis: *P. radiata.*

Jeffreyi. Lvs. in clusters of 3, to 8 in. long, pale bluish-green: cones conic-ovoid, to 12 in. long. Ore. to Calif; hardy N.

koraiensis (*P. mandshurica*). Korean P. Lvs. in clusters of 5, to 4 in. long, dark green: cones conic-oblong, to 6 in. long. Japan, Korea; hardy N., but grows slowly in northern climates and should be planted in sheltered positions.

Lambertiana. Sugar P. Lvs. in clusters of 5, to 4 in. long, sharp-pointed, with white lines on back: cones cylindric, to 20 in. long. Ore. to Lower Calif.; hardy N., needs protection from winter winds.

Laricio: *P. nigra.*

leucodermis. Graybark P. Lvs. in clusters of 2, to 2½ in. long, stiff, bright green: cones ovoid, 3 in. long. Balkan Peninsula; hardy N.

longifolia. Lvs. in clusters of 3, to 12 in. long, drooping, light green: cones conic-ovoid, to 7 in. long. Himalayas.

mandshurica: *P. koraiensis.*

Massoniana. Lvs. in clusters of 2, to 8 in. long, thin, light green: cones ovoid, to 3 in. long. China.—The material usually cult. under this name is *P. densiflora.*

mitis: *P. echinata.*

mongolica: a listed name.

monophylla: *P. cembroides* var.

monspeliensis: *P. nigra* var. *cebennensis.*

montana: *P. Mugo.*

Montezumæ. Lvs. usually in clusters of 5, to 12 in. long, often bluish-green: cones conical, to 12 in. long. Mex. to Guatemala. Var. **Hartwegii** has shorter lvs. and smaller cones.

monticola. Western White P. Lvs. in clusters of 5, to 4 in. long, stiff, bluish-green: cones cylindric, to 11 in. long. B. C. to Calif.; hardy N.

Mugo (*P. montana*). Swiss Mountain P. Lvs. in clusters of 2, to 2 in. long, crowded, bright green: cones ovoid, to 2¼ in. long. Eu.; hardy N. Var. **compacta.** Dense globose form. Var. **Mughus** (var. *prostrata*). Commonly a prostrate shrub with shorter cones. Var. **pumilio** (*P. pumilio*). Usually shrubby. Var. **rostrata** (*P. montana* var. *uncinata*). Tree to 80 ft. Var. **rotundata.** Tree to 30 ft. with several sts.

muricata. Bishop P. Lvs. in clusters of 2, to 7 in. long, stiff, usually twisted, dark green: cones oblong-ovoid, to 3½ in. long. Calif.

Murrayana: *P. contorta* var. *latifolia.*

Nelsoni. Lvs. in clusters of 3, to 3½ in. long, grayish-green: cones cylindric. Mex.

nigra (*P. Laricio*). Austrian P. Lvs. in fascicles of 2, to 6½ in. long, stiff, dark green: cones ovoid, to 3½ in. long. Eu., Asia Minor.; hardy and good. Var. **austriaca.** Broad-headed tree with dark gray bark. S. E. Eu. Var. **calabrica** (var. *Poiretiana*). Corsican P. Tree with narrower head and lighter twisted green lvs. S. Eu. Var. **caramanica** (var. *Pallasiana*). Crimean P. Tree with broad pyramidal head and glossy lvs. W. Asia. Var. **cebennensis** (*P. monspeliensis. P. horizontalis*). Lvs. slender, cones smaller. S. France, Pyrenees. Var. **globosa** is very dense. Var. **pendula** has drooping branches, var. **prostrata** prostrate branches, and var. **pygmæa** is dwarf.

palustris. Longleaf P. Lvs. in clusters of 3, forming tufts at ends of branchlets, to 18 in. long, dark green: cones cylindric, to 10 in. long. Va. to Fla. and Miss.; adaptable in the S.

Parryana: *P. cembroides* var.

parviflora. Japanese White P. Lvs. in clusters of 5, forming tufts at ends of branchlets, to 1½ in. long, bluish-green: cones ovoid, to 3 in. long. Japan; hardy N. Var. **glauca** has glaucous lvs. Var. **pentaphylla** (*P. pentaphylla*) has longer lvs. and larger cones.

patula. Lvs. usually in clusters of 3, to 12 in. long, drooping, grass-green: cones conic-ovoid, to 4½ in. long. Mex.

pentaphylla: *P. parviflora* var.

Peuce. Macedonian P. Lvs. in clusters of 5, to 4 in. long, bluish-green: cones cylindric, to 6 in. long. Balkan Mts.; very hardy.

Pinaster. Cluster P. Lvs. in clusters of 2, to 9 in. long, stiff, glossy green: cones conic-ovoid, to 7 in. long. Medit. region; will stand only S. and in Calif., although it may be grown in favored positions in S. New England if protected. Var. **Hamiltonii** has shorter lvs. and larger cones.

Pinceana. Lvs. in clusters of 3, to 6 in. long: cones cylindric, to 3½ in. long. Mex.

Pinea. Italian Stone P. Lvs. in clusters of 2, to 8 in long, stiff, bright green: cones ovoid, to 5½ in. long. Medit. region.

ponderosa. Western Yellow P. Lvs. usually in clusters of 3, to 11 in. long, dark green: cones ovoid-oblong, to 6 in. long. B. C. to Mex. and Tex.; hardy N. Var. **arizonica** has shorter lvs. and cones. Ariz., New Mex. Var. **pendula** has drooping branches. Var. **scopulorum** (*P. scopulorum*), Rocky Mt. Yellow P., is smaller.

pumila. Dwarf Stone P. Shrub with prostrate branches: lvs. in clusters of 5, to 3 in. long: cones ovoid, to 1¾ in. long. N. Asia.

pumilio: *P. Mugo* var.

pungens. Table Mountain P. Lvs. in clusters of 2 or 3, to 2½ in. long, stiff and twisted, dark green: cones conic-ovoid, to 3½ in. long. N. J. to Ga.

pyrenaica: *P. halepensis* var. *brutia.*

quadrifolia: *P. cembroides* var. *Parryana.*

radiata (*P. insignis*). Monterey P. Lvs. in clusters of 3, to 6 in. long, bright green: cones conic-ovoid, to 7 in. long. S. to Lower Calif.

resinosa. Red P. Lvs. in clusters of 2, to 6 in. long, flexible, glossy: cones conic-ovoid, to 2½ in. long. Newf. to Pa. and Minn.; a good species for ornament. Var. **globosa** is a dwarf globose form.

rhaetica. Hybrid between *P. Mugo* and *P. sylvestris.*

rigida. Pitch P. Lvs. in clusters of 3, to 5 in. long, stiff and spreading, dark green: cones ovoid, to 4 in. long. N. B. to Ga. and Ky. Var. **serotina,** Pond P., is a round-topped tree with longer lvs. and shorter cones.

Sabiniana. Digger P. Lvs. in clusters of 3, to 12 in. long, pale bluish-green: cones ovoid, to 10 in. long. Calif.

scopulorum: *P. ponderosa* var.

sinensis: *P. tabulæformis.*

Strobus (*Strobus Strobus*). White P. Lvs. in clusters of 5, to 5 in. long, soft, bluish-green: cones cylindric, to 4 in. long. E. N. Amer. Hort. vars. are: **fastigiata,** with narrow-pyramidal head; **glauca,** lvs. bright bluish-green; **nana,** dwarf bush form; **prostrata,** dwarf with trailing branches; **umbraculifera,** dwarf umbrella-shaped form.

sylvestris. Scots P. Lvs. in clusters of 2, to 3 in. long, stiff and twisted, bluish-green: cones conic-oblong, to 2½ in. long. Eu., Asia; one of the hardiest. Hort. vars. are: **argentea,** lvs. silvery; **aurea,** lvs. golden-yellow when young; **engadinensis,** slow-growing, lvs. shorter, Tyrol; **fastigiata,** with narrow-pyramidal head; **lapponica,** lvs. broader and shorter, N. Eu.; **nana,** low dense bush; **pendula,** branches drooping; **pumila,** dwarf globose bush; **rigensis,** bark very red; **scotica,** bark very red, lvs. shorter; **Watereri,** columnar, lvs. steel-blue.

tabulæformis (*P. sinensis*). Chinese P. Lvs. in clusters of 2 or 3, to 4 in. long, stiff: cones ovoid, to 2½ in. long. China; hardy N. Var. **densata** has 2 lvs.

Tæda. Loblolly P. Lvs. in clusters of 3, to 9 in. long, bright green: cones conic-oblong, to 5 in. long. N. J. to Tex.

Teocote. Lvs. in clusters of 3, to 8 in. long, stiff: cones cylindric-ovoid, 2½ in. long. Mex.

Thunbergii. Japanese Black P. Lvs. in clusters of 2, to 4½ in. long, sharp-pointed, bright green: cones conic-ovoid, to 3 in. long. Japan; hardy N. In var. **oculus-draconis** the lvs. have 2 yellow bands.

Torreyana. Torrey P. Lvs. in clusters of 5, to 13 in. long, stiff, dark green: cones ovoid, to 6 in. long. S. Calif.

tuberculata: *P. attenuata.*

virginiana. Scrub P. Lvs. in clusters of 2, to 3 in. long, stiff and twisted: cones conic-ovoid, to 2½ in. long. N. Y. to Ga. and Ala.

yunnanensis (*P. sinensis* var. *yunnanensis*). Lvs. usually in clusters of 3, to 8 in. long: cones ovoid, to 3½ in. long. W. China.

PINXTER-FLOWER: *Rhododendron nudiflorum.*

PINYON: *Pinus cembroides.*

PIPER. Pepper. *Piperaceæ.* Herbaceous and woody plants of many species over the world, various in habit and appearance, having alternate lvs. and minute fls. borne in catkin-like mostly slender spikes; a few are grown in collections of economic plants and sometimes as foliage subjects; erect bushes or root-climbers. Of easy cult. Propagated by cuttings under glass, or by seed when available.

Cubeba. Cubeb. Climbing or tree-like: lvs. oval or narrower: berries brownish, used for medicinal purposes. E. Indies.

metallicum: hort. name for a form with thick metallic-green lvs.

nigrum. Pepper. Climbing: lvs. ovate to nearly orbicular: berries yellowish-red, furnishing when dried commercial black pepper, or white pepper when the pericarp is removed. Old World tropics and now widely dispersed.—For the pepper of vegetable-gardens see *Pepper* and *Capsicum.*

ornatum. Climbing: lvs. ovate-orbicular, peltate, spotted pink above when young and white when old. Celebes.

PIPERACEÆ. Pepper Family. About 9 genera comprise this widely distributed and populous family: herbs or woody plants with entire lvs., very small fls. without perianth borne in dense spikes or racemes, having mostly 2–6 stamens, superior 1-celled ovary and fr. a berry. Macropiper, Peperomia and Piper may be grown for the foliage or the last for economic products.

PIPSISSEWA: *Chimaphila.*

PIPTADENIA. *Leguminosæ.* Trop. shrubs or trees with bipinnate lvs. and small white fls. in heads or spikes; one species furnishes a gum and the tree may be planted for ornament in warm countries.

rigida. Tree or shrub: lfts. linear, oblique, ⅓ in. long, shining: fls. in axillary spikes to 1½ in. long: pods linear, to 5 in. long. Brazil.

PIPTANTHUS. *Leguminosæ.* Shrubs, deciduous or partially evergreen, with lvs. of 3 entire sessile lfts., yellow papilionaceous fls. in terminal racemes, and linear flattened pods; native in Himalayas and China and adapted to S. U. S.

concolor. To 6 ft.: lfts. ovate-lanceolate, to 4½ in. long: pods to 4½ in. long, glabrous. China.

nepalensis. To 10 ft.: lfts. lanceolate, to 5½ in. long, glaucous beneath: pods to 4½ in. long, slightly pubescent. Himalayas.

tomentosus. To 7 ft.: lfts. ovate to ovate-lanceolate, tomentose beneath: pods to 3 in. long, tomentose. China.

PIQUERIA. *Compositæ.* Trop. American shrubs or herbs with opposite entire or toothed lvs. and clustered small heads of white or whitish disk-fls.; pappus none or of scales.

Under the name Stevia, florists grow one species of Piqueria for the profuse small winter bloom, and it is also adapted to bedding-out. It is propagated by cuttings and division as well as by means of seeds.

trinervia (*Stevia serrata* of Hort.). Per.: lvs. lanceolate to oblong-lanceolate, toothed: heads 3–5-fld., white, fragrant, borne in small panicled corymbs. Mex., Cent. Amer. and Haiti. Var. **variegata** has lvs. edged or splashed with white; often grown as a pot-plant.

PIRCUNIA: *Phytolacca dioica.*

PISONIA. *Nyctaginaceæ.* Trees and shrubs of trop. and subtrop. regions, with simple lvs. and small unisexual or bisexual fls. borne in panicles; intro. in Calif.

Brunoniana. To 20 ft. or more, glabrous: lvs. oblong, to 15 in. long: fls. greenish, ⅕ in. long: fr. linear, to 1¼ in. long, with very sticky ribs. S. Sea Isls., New Zeal., Australia.

PISTACHE: *Pistacia.*

PISTACHIO: *Pistacia vera.*

PISTACIA. Pistache. *Anacardiaceæ.* Trees and shrubs, deciduous or evergreen, with compound lvs., small diœcious fls. without petals, 5 stamens, 1-celled ovary and dry drupaceous fr.; about 20 species in the Medit. region to Asia, 1 in Canary Isls. and 1 in Mex. and Calif.; one grown for its nut or kernel which is used in confectionery, and others yielding gums and oils; not hardy in northern states.

The pistaches may be grown in any climate suitable to the olive. Trees may be planted 25 feet apart, about one male to every six females to insure pollination. Propagated by budding and grafting, also by seeds.

chinensis. Deciduous tree to 60 ft.: lvs. of 5–6 pairs of lfts.: fr. scarlet turning purple. China.

Lentiscus. Evergreen tree to 15 ft.: lvs. of 3–5 pairs of leathery lfts., petioles winged: fr. reddish turning to black. Medit. region.

Terebinthus. Small deciduous tree: lfts. 9–13, petiole somewhat winged: fr. dark purple and wrinkled. Medit. region.

texana. Tree to 30 ft.: lvs. partially or wholly persistent, with winged petiole and 4–9 pairs of oblong-spatulate lfts.: fr. oval, brown, about ¼ in. long. Tex., Mex.

vera. Pistachio. Spreading deciduous tree to 30 ft.: lvs. of 1–5 pairs of lfts.: fr. reddish and wrinkled, containing the green or yellow seed or kernel of commerce. Medit region and Orient.—Grown for its comestible nut; much esteemed in Medit. countries. The pistachio thrives in regions to which the olive is adapted. It may be budded or grafted on other species of the genus. There are several hort. vars.

PISTIA. *Araceæ.* One free-floating per. native in trop. Amer. and southermost U. S., grown in aquaria and ponds in warm regions. The summer temperature of the water should be between 70–80° and the plants should be shaded from direct sunlight in the middle of the day for best result. **P. Stratiotes.** Water-Lettuce. Stoloniferous and having long feathery hanging roots, the rosettes of lvs. about 6 in. across: lvs. obovate or round, very obtuse, to 5 in. long, bright green and velvety-scurfy: spathes very small.

PISTIL: the ovule-bearing body (becoming the seed-bearing organ), with style and stigma.

PISTILLATE: having pistils and no stamens; female.

PISUM. Pea. *Leguminosæ.* Herbs with pinnate lvs., the terminal lft. represented by a branched tendril, papilionaceous fls. solitary or few in the axils, and flattened pods; widely grown for the edible seeds and pods and some forms for forage. For cult. see *Pea.*

arvense: *P. sativum* var.

sativum. Garden P. Ann., climbing to 6 ft.: lfts. oval to oblong: fls. white, 1–3 together: pods to 4 in. long. Eu. and Asia. Var. **arvense** (*P. arvense*), Field P., has pinkish fls. with purple wings and greenish keel, and is grown for forage. Var. **humile**, Early Dwarf P., is a low form with small pods. Var. **macrocarpon**, Edible-podded P., has soft pods to 6 in. long.

PITANGA: *Eugenia uniflora.*

PITCAIRNIA. *Bromeliaceæ.* Mostly terrestrial herbs native in trop. Amer., with narrow lvs. in rosettes and red, yellow or nearly white fls. in spikes or racemes; sometimes seen in choice greenhouse collections. For cult. see *Bromeliaceæ.*

corallina. Lvs. about 3 ft. long and 4 in. wide, the petioles with brown spines: fls. coral-red, in racemes about 1 ft. long on red stalks to 1 ft. long. Colombia.

punicea. Lvs. to 10 in. long and ½ in. wide, slightly spiny, white-scaly on the back: fls. scarlet, in racemes to 9 in. long on very short stalks. Mex.

PITCHER-PLANT: *Nepenthes, Sarracenia.* California: *Darlingtonia californica.*

PITHECELLOBIUM (*Pithecolobium*). *Leguminosæ.* Trees and shrubs with 2-pinnate lvs., small fls. in heads or spikes, and flattened usually twisted and contorted pods; grown for ornament in trop. and semi-trop. regions. Some species yield tannin and the wood is useful for minor building purposes.

dulce (*Inga dulcis*). Guaymochil. Huamuchil. Opiuma. Manila Tamarind. Tree to 50 ft., spiny: fls. white, in dense sessile heads, pubescent: pods spirally twisted, to 5 in. long, red. Trop. Amer., Philippines, E. Indies.

lanceolatum. Tree to 40 ft., spiny: fls. white, in dense spikes to 5 in. long: pods nearly straight or curved, to 5 in. long. Mex., Cent. Amer., N. S. Amer.

Saman: *Samanea Saman.*

Unguis-cati. Cats-Claw. Black-Bead. Shrub or tree to 15 ft., spiny: fls. greenish-yellow, in stalked heads, glabrous: pods spirally twisted, to 4 in. long, red. Fla., W. Indies, N. S. Amer.

PITHECOCTENIUM. *Bignoniaceæ.* Evergreen woody vines with lvs. of 2–3 lfts. and 3-parted thread-like tendrils, bell-shaped fls. in terminal racemes or panicles, and large prickly capsular frs.; native from Mex. to Argentina and hardy only in warm climates. Propagated by cuttings.

clematideum: *P. cynanchoides.*

cynanchoides (*P. clematideum*). Lfts. ovate, to 2 in. long: fls. white, to 2 in. long: fr. 2½ in. long, covered with yellowish spines. Argentina, Uruguay.

echinatum (*P. muricatum*). Lfts. ovate, to 4 in. long: fls. white turning yellow, to 2 in. long: fr. to 8 in. long, covered with sharp tubercles. Mex. to Brazil.

muricatum: *P. echinatum.*

PITHECOLOBIUM: *Pithecellobium.*

PITTOSPORACEÆ. Pittosporum Family. Trees and shrubs, sometimes climbing, with alternate simple lvs., bisexual polypetalous fls. having 5 sepals and 5 petals, 5 stamens, superior ovary, and fr. a dehiscent caps. or indehiscent and berry-like; native mostly in Australia, but Pittosporum is widely distributed in Old World tropics. Billardiera, Bursaria, Hymenosporum, Pittosporum and Sollya are grown for ornament in the warmer parts of the country and sometimes under glass.

PITTOSPORUM. *Pittosporaceæ.* Many evergreen trees and shrubs with simple lvs., fls. solitary or in panicles, and fr. a caps. with leathery valves; native in tropics and subtropics of Old World; of good habit, attractive in foliage, flower and fruit.

Pittosporums are cultivated in southern California and southern states for ornament and hedges, and *P. Tobira* is sometimes seen under glass. Propagated by seeds sown in a cool greenhouse, by cuttings of half-ripened wood, or by grafting, principally on *P. undulatum.*

bicolor. Small tree: lvs. oblong-lanceolate, tomentose beneath, margins usually recurved: fls. purple and yellow, about ⅓ in. long, solitary or few: fr. tomentose. New S. Wales.

Buchanani. Shrub or tree to 20 ft.: lvs. oblong, to 5 in. long, acute: fls. dark purple, solitary: fr. about ⅓ in. diam. New Zeal.

Colensoi. Small tree: lvs. oblong, to 4 in. long, acute, leathery: fls. dark purple, usually solitary: fr. about ½ in. across. New Zeal.

crassifolium. Karo. Shrub or tree to 30 ft.: lvs. obovate, to 3 in. long, obtuse, leathery, shining above, white-tomentose beneath, margins revolute: fls. red or purple, to ½ in. long, in terminal clusters: fr. to 1¼ in. long, tomentose. New Zeal.

erioloma. Shrub to 12 ft.: lvs. obovate, to 3 in. long, leathery, margins revolute: fls. yellowish, ½ in. long, in terminal clusters: fr. to ¾ in. across. Lord Howes Isl.

eugenioides. Tarata. Tree to 40 ft.: lvs. elliptic, to 4 in. long, acute, margins usually undulate: fls. yellowish, fragrant, to ¼ in. long, in terminal compound umbels: fr. ¼ in. long. New Zeal. Var. variegatum has variegated foliage.

Fairchildii. Shrub to 15 ft.: lvs. obovate, to 3 in. long, obtuse or acute, leathery: fls. purple, solitary or in 2–4-fld. terminal clusters: fr. to 1 in. across. New Zeal.

ferrugineum. Tree to 60 ft.: lvs. ovate to lanceolate, to 4 in. long, rusty-tomentose when young, long-petioled: fls. greenish-white, ¼ in. long, in terminal clusters: fr. ⅓ in. across. Malaya to Australia.

floribundum. Small tree: lvs. lanceolate, to 8 in. long, leathery and shining, margins undulate: fls. yellow, small, in terminal compound corymbs. Himalayas.

grandiflorum: hort. name.

heterophyllum. Spreading shrub to 10 ft.: lvs. of various shapes, small, glabrous: fls. pale yellow, very fragrant, small, few together. Rocky places, China.

Hosmeri. Tree to 25 ft.: lvs. oblong, to 10 in. long, brown-tomentose beneath, margins revolute: fls. cream-colored, about ½ in. long, in corymbs: fr. to 2 in. across, becoming orange-yellow. Hawaiian Isls. Var. **longifolium** has lvs. to 16 in. long, and 3½ in. wide.

Kirkii. Shrub to 12 ft.: lvs. linear-obovate, to 5 in. long, very leathery, margins thickened: fls. yellow, in terminal umbels: fr. 1½ in. long. New Zeal.

nigricans: *P. tenuifolium.*

phillyræoides. Narrow-leaved or Willow P. Tree to 20 ft., the branchlets drooping: lvs. linear-lanceolate, to 4 in. long: fls. yellow, ⅓ in. long, solitary or in axillary clusters: fr. ½ in. long, deep yellow. Australia.

Ralphii. Differs from *P. crassifolium* in the lvs. not revolute and the fr. only ⅔ in. long. New Zeal.

revolutum. Tall shrub: lvs. elliptic, to 4 in. long, rusty-tomentose beneath: fls. pale yellow, ½ in. long, in terminal clusters: fr. to ¾ in. long. Australia.

rhombifolium. Queensland P. Tree to 80 ft.: lvs. rhomboid-oval, to 4 in. long, coarsely toothed above middle: fls. white, ¼ in. long, in terminal compound corymbs: fr. ¼ in. long, becoming orange-yellow. Australia.

tenuifolium (*P. nigricans*). Tawhiwhi. Kohuhu. Tree to 30 ft.: lvs. oblong, to 2½ in. long, margins undulate: fls. dark purple, to ½ in. long, solitary or in axillary clusters: fr. ½ in. across. New Zeal.—There is a variegated form.

Tobira. Japanese P. Shrub to 10 ft., useful as a hedge plant in southernmost states: lvs. obovate, to 4 in. long, obtuse, very thick and leathery, margins revolute: fls. white or greenish, fragrant, to ½ in. long, in terminal clusters: fr. to ½ in. long, tomentose. China, Japan. Var. variegata has lvs. variegated with white.

umbellatum. Tree to 25 ft.: lvs. oblong, to 4 in. long, pale below, leathery: fls. in many-fld. terminal umbels: fr. ½ in. across. New Zeal.

undulatum. Victorian Box. Tree to 40 ft.: lvs. oblong to lanceolate, to 6 in. long, acuminate, shining, margins usually undulate: fls. white, fragrant, to ½ in. long, in terminal clusters: fr. to ½ in. across. Australia.

viridiflorum. Cape P. Shrub to 25 ft.: lvs. obovate, to 3 in. long, acute or obtuse, leathery and shining, margins often revolute: fls. yellowish-green, to ¼ in. long, in dense terminal clusters: fr. ¼ in. long. S. Afr.

PITYROGRAMMA (*Ceropteris*). Gold- and Silver-Ferns. *Polypodiaceæ.* Well-known conservatory ferns, sometimes known as Ceropteris and Gymnogramma, with mostly 2-pinnate tufted lvs. interesting for the white or bright yellow powder on the under surface; sori linear, borne along veins on back of segms.; native mostly in trop. Amer. They are plants of simple requirements, readily grown in an intermediate temperature in pots and pans. See *Ferns.*

calomelanos (*Gymnogramma calomelanos*). Silver-F. Lvs. to 3 ft. long and 10 in. wide, powdery white beneath, segms. toothed or cut, stalks as long as blades. Trop. Amer., trop. Afr. Var. **aureo-flava** (*Gymnogramma chrysophyllum, P. chrysophylla*). Gold-F., has gold colored powder.

chrysophylla: *P. calomelanos* var. *aureo-flava.*

Laucheana: hort. form or hybrid related to *P. calomelanos* var. *aureo-flava.*

sulphurea (*Gymnogramma sulphurea*). Jamaica Gold-F. Lvs. to 1 ft. long and 5 in. wide, powder sulfur-yellow, segms. cut, stalks much shorter than blades. W. Indies.

tartarea (*Gymnogramma tartarea*). Lvs. to 2½ ft. long and 1 ft. wide, white powdery beneath, segms. entire or cut, stalks as long as blades. Trop. Amer.

triangularis (*Gymnogramma triangularis*). California Gold-F. Lvs. to 7 in. long and 6 in. wide, on stalks to 1 ft. long, deep golden-yellow beneath, sometimes white. Calif. to B. C.

PITYROSPERMA ACERINUM: *Cimicifuga japonica.*

PLAGIANTHUS. *Malvaceæ.* Trees and shrubs, seldom herbaceous, native in Australia and New Zeal., with alternate simple lvs., small bisexual or unisexual fls. and frs. of 1 or several carpels; sometimes grown in S. Calif.

betulinus. Tree to 60 ft.: lvs. ovate to ovate-lanceolate, to 3 in. long, coarsely toothed: fls. small and not showy, in panicles to 9 in. long. New Zeal.

Lyallii: *Gaya Lyallii.*

pulchellus. Shrub: lvs. lanceolate, to 3 in. long, coarsely toothed: fls. small, in axillary racemes. Australia.

PLANERA. *Ulmaceæ.* One decidous elm-like tree to 40 ft., native from S. Ill. to Fla. and Tex., not hardy far N. **P. aquatica.** Water-Elm. Lvs. alternate, ovate, to 2½ in. long, toothed: fls. small, unisexual or bisexual, in clusters: fr. a small drupe with crested ribs.—Propagated by seeds sown in spring, by layers, and by grafting on the elm. For other Planera names, see *Zelkova.*

PLANE-TREE: *Platanus.*

PLANTAGINACEÆ. Plantain Family. Three genera of herbs and subshrubs of wide distribution, with basal lvs. and sometimes alternate or opposite ones on the st., mostly bisexual small not showy fls. in heads or spikes, having 4-lobed scarious corolla, 4-parted calyx, 4 exserted stamens, superior ovary, and fr. a caps. or nutlet inclosed by the calyx. A few plantagos are sometimes planted for interest, although they are weedy subjects, and some of the species are true weeds about dwellings and in lawns.

PLANTAGO. Plantain. *Plantaginaceæ.* Herbs or rarely shrubs mostly of temp. regions and rarely grown in the garden; mostly weedy plants. Propagated by seeds.

Cynops. Subshrub to 1½ ft.: lvs. linear, to 3 in. long: fls. whitish, in heads ½ in. long. S. Eu.

maritima. Ann., bien. or per., acaulescent: lvs. linear, to 10 in. long: fls. in dense spikes to 5 in. long. Seashores and salt marshes, N. Amer., Eu., Asia.

patagonica. Ann. to 1 ft.: lvs. linear to oblanceolate: fls. in dense cylindrical or oblong spikes. Mex., S. Amer.

Psyllium. Ann. to 8 in.: lvs. linear or linear-lanceolate, to 1½ in. long: fls. in ovoid spikes ½ in. long. S. Eu. to India.

PLANTAIN: *Musa paradisiaca, Plantago.* Poor Robins: *Erigeron pulchellus.* Rattlesnake: *Epipactis pubescens.* Water-: *Alisma.* Wild: *Heliconia Bihai.*

PLATANTHERA: *Habenaria.*

PLATANUS. Plane-Tree. The only genus of *Platanaceæ.* Deciduous monœcious large trees with pale bark shedding in plates, large alternate palmately-lobed lvs., and unisexual fls. in dense globular drooping heads in spring; native in N. Amer., S. Eu. to India. Sometimes known as sycamore, but this name belongs to *Ficus Sycamorus.*

Plane-trees thrive best on rich moist soil and withstand transplanting well. The species herein are hardy North with the exception of *P. racemosa* which will thrive only in the southern states. They are useful as street trees and for extensive lawns, and bear heavy pruning; sometimes in confined areas they are sheared to dense small heads. Propagated by seeds, by cuttings under glass, by layers, and varieties sometimes by grafting.

acerifolia. London P. Hybrid between *P. occidentalis* and *P. orientalis*: to 120 ft.: lvs. with 3–5 triangular lobes about ⅓ length of blade: fr.-heads 2 or sometimes more to a st., bristly. Common tree often passing as *P. orientalis.* Var. Suttneri has lvs. blotched with creamy-white.

californica: *P. racemosa.*

occidentalis. Buttonwood. To 150 ft.: lvs. with 3–5 shallow triangular lobes: fr.-heads usually solitary, smooth. Me. to Fla. and Tex.

orientalis. Oriental P. To 100 ft.: lvs. with 5–7 narrow lobes about ½ length of blade: fr.-heads 2–6 to a st., bristly. S. E. Eu., W. Asia.—Not often seen in this country, at least not in the N.: see *P. acerifolia.*

racemosa (*P. californica*). To 90 ft.: lvs. thick, with 3–5 deep entire lobes, tomentose beneath: fr.-heads 2–7 to a st., bristly. S. Calif., Lower Calif.

PLATYCARYA. *Juglandaceæ.* One Chinese deciduous monœcious shrub or tree to 40 ft., **P. strobilacea.** Lvs. of 7–15 ovate- to oblong-lanceolate lfts. to 4 in. long: fls. without perianth, the staminate in slender catkins to 5 in. long, the pistillate in cone-like catkins to 2 in. long that bear small winged nutlets under the scales.—A sumach-like bush, not hardy N. Propagated by seeds and layers.

PLATYCERIUM (*Alcicornium*). Staghorn-Fern. *Polypodiaceæ.* Noble epiphytic ferns with two types of lvs., the sterile flat, rounded, shield-shaped, entire, parchment-like, clasping the tree or support on which they grow, the fertile lvs. erect, spreading or drooping, with antler-like segms. bearing naked sori beneath; trop. Afr. and Asia to temp. Australia.

The staghorn-ferns are striking plants when old and well-grown. *P. bifurcatum* does well in a cool temperature but the others are tropical. Most of them produce suckers, by which (as well as by spores) they may be propagated. They thrive on pieces of tree-fern trunks or even on boards if provided with a chunk of peat and moss for foothold, which may contain a little charcoal; a little bone-meal may be added now and then if needed. They may be checked a little in winter.

æthiopicum: *P. Stemaria.*

alcicorne: *P. bifurcatum.*

angolense. Fertile lvs. not lobed, to 1½ ft. long, rusty-tomentose beneath. W. Afr.

biforme. Sterile lvs. lobed above; fertile lvs. much forked, to 5 ft. long; spores borne on 2 kidney-shaped appendages. Java.

bifurcatum (*P. alcicorne*). Common S. Grayish-green, pubescent; sterile lvs. wavy-margined; fertile lvs. clustered, drooping, to 3 ft. long, forked into narrow segms., sori extending to tips. Australia, Polynesia. Var. majus is larger, greener, more leathery.

grande. Nearly glabrous: both sterile and fertile lvs. stag-like, to 6 ft. long, the sori borne in patch at base of first fork. Australia.

Hillii. Deep green: fertile lvs. erect, 1½ ft. or more long, repeatedly forked, sori not extending to tips. Australia.

Stemaria (*P. æthiopicum*). Triangle S. Fertile lvs. twice forked, drooping, to 3 ft. long, white-tomentose beneath, sori extending part way down forks. W. trop. Afr.

Veitchii. Sterile lvs. brownish; fertile lvs. to 2 ft. long, narrow at base, becoming 4 in. wide where branches into 6–8 lobes, white-hairy beneath. Australia.

Wallichi. Similar to *P. grande* but yellowish-tomentose. Malaya.

Willinckii. Java S. Fertile lvs. in 3's, drooping, forked into long narrow segms. bearing sori nearly to tips. Java.

PLATYCLINIS: *Dendrochilum.*

PLATYCODON. *Campanulaceæ.* One showy per. herb native in E. Asia and differing from Campanula chiefly in the opening of the caps. **P. grandiflorum** (*Campanula grandiflora*). Balloon-Flower. To 2½ ft.: lvs. ovate to ovate-lanceolate, to 3 in. long, sharp-toothed, glaucous beneath: fls. deep blue or white in var. **album,** open-bell-shaped, to 3 in. across, solitary, June-July. Var. **autumnale** flowers later. Var. **japonicum** has a 10-lobed star-like corolla. Var. **Mariesii** grows to 1½ ft. and has large fls. Dwarf forms are listed as **nana** and **pumila** and partially double forms as **semi-duplex** and **semi-plenum.**—It succeeds in sandy loam in well-drained locations. Propagated by seeds or by division in the spring.

PLATYLOMA: *Pellæa falcata.*

PLATYMISCIUM. *Leguminosæ.* Trop. American trees or shrubs with opposite pinnate lvs., yellow papilionaceous fls. in racemes, and flattened pods; intro. in Calif.

polystachyum. Roble. Tree to 90 ft.: lfts. shining: fls. orange, ½ in. across, in partially drooping racemes on old wood: pods 2½ in. long and 1 in. wide, 1-seeded. Trinidad, N. S. Amer., Panama.

PLATYSTEMON. *Papaveraceæ.* One Californian ann. suitable for the flower-garden. Propagated by seeds. **P. californicus.** Cream-Cups. To 1 ft.: lvs. linear-oblong, entire: fls. cream-yellow, 1 in. across, solitary on long stalks: fr. of many linear carpels distinct or partially united.—In Calif. it covers great areas of open country in spring.

PLEIOGYNIUM. *Anacardiaceæ.* One diœcious species from Queensland, Australia, with compound lvs., fls. in axillary racemes, 10 stamens, 5–12-celled ovary and somewhat compressed drupaceous fr. **P. Solandri** (*Spondias Solandri*). Burdekin-Plum. Evergreen tree to 60 ft.: lvs. of 7–9 ovate to oblong entire lfts. to 4 in. long: fls. greenish, densely clustered: fr. 1½ in. across, used for jellies and jams. Cult. in Calif. and Fla.

PLEIONE. *Orchidaceæ.* Epiphytes with ann. pseudobulbs bearing 1 deciduous lf. and usually solitary fls., the sepals and petals similar, the lip with fringed keels; grown in the cool greenhouse. See *Orchids.*

birmanica: *P. præcox.*

lagenaria. Lvs. to 5 in. long: fls. rose-violet, the lip yellow at base and spotted with dark red, Oct.–Nov. Burma.

maculata. Lvs. 5 in. or less long: fls. white, the sepals and petals lined with violet and the lip spotted with yellow and violet, Oct. Himalayas.

præcox (*P. Wallichiana. P. birmanica*). Lvs. to 10 in. long: fls. violet-red with white and yellow crests on lip, Oct. Himalayas.

Wallichiana: *P. præcox.*

PLEIOSPILOS. *Aizoaceæ.* Stemless plants without internodes separated from Mesembryanthemum (which see for cult.), bearing 1 or 2 pairs of short thick ovate lvs. and large showy terminal fls. in the foliage; stigmas 9–14. **P. Bolusii** (*M. Bolusii*) has 2 thick stone-like connate lvs. 2 in. diam., at maturity with shrivelled ones underneath, and fls. in the cleft between them: fl. sessile, to 3 in. across, with numerous very narrow petals that are dull red toward apex and yellow below the middle. S. Afr.

PLEROMA: *Tibouchina.*

PLEURISY-ROOT: *Asclepias tuberosa.*

PLEUROTHALLIS. *Orchidaceæ.* Epiphytes native in trop. Amer., with 1-lvd. sts. and small fls. in racemes or solitary from the axil of lf., the petals usually smaller than sepals, the lip simple or 3-lobed. For cult. see *Orchids*; grown mostly as for Cattleyas, in shallow pans near glass.

Roezlii. To 2 ft.: lvs. linear, to 9 in. long: fls. dark purple, 1½ in. long, in 8–12-fld. nodding racemes longer than lvs., Jan.–Feb. Colombia.

tridentata. Lvs. to 3 in. long and ½ in. across, 3-toothed at apex: fls. very small, yellow. Venezuela.

velaticaulis. To 1 ft. or more: lvs. to 5 in. long and 1 in. across: fls. yellow, in racemes about length of lvs. and inclosed by a leathery spathe. W. Indies, N. S. Amer.

PLUM. The group of fruits known as plum is comprised of several natural species of widely different nativities. An understanding of these sources is essential to a clear analysis of plum culture.

(A) The Domesticas, *Prunus domestica*, probably originally from southwestern Asia. Here are included the common plums and prunes long grown in Europe and the eastern states and on the Pacific coast. Such varieties as Bavay (Green Gage), Bradshaw, Lombard, Agen, Damsons, Egg plums, Reine Claude, Grand Duke, Washington, belong here. To be associated with these kinds are the myrobalan and cherry plums, *Prunus cerasifera*, probably of similar nativity. This species is much employed as a stock on which to work the Domesticas, and it yields a few minor varieties of pomological fruits as De Caradeuc, Golden Cherry.

(B) The Japanese plums, *P. salicina* (*P. triflora*) represented by Abundance, Chabot, Red June, Burbank, Satsuma, Kelsey, Georgeson, and others. The Japanese kinds thrive over a wider extent of territory than the Domesticas.

(C) The Americana plums, products in recent time of several native species as of *P. americana*, *P. nigra*, *P. hortulana*, *P. Munsoniana*, *P. angustifolia*. Varieties of this native group are Wild Goose, Golden Beauty, Cheney, Hawkeye, De Soto, Forest Garden, Newman, Miner, Wolf, Weaver, Wayland, and many others. These plums thrive over a wide range in the interior country and the South.

These more than half a dozen species contribute, by their diverse climatic requirements, to the growing of plums over practically the whole of the United States and far north into Canada. The European plum is of the greatest importance, being largely grown in the fruit regions of New England, the Great Lakes states and provinces, and particularly on the Pacific coast where it furnishes the varieties raised for prunes. The Japanese plum is grown over much the same region and in addition somewhat further south along the Atlantic coast and in the Mississippi Valley. The Damson plums (which are forms of *P. domestica*) extend the range of these two species somewhat farther north. The native species are valuable in extending plum culture into the far north and, by their resistance to heat and disease, into the lower Mississippi Valley and the Gulf states.

Soil requirements are various, although any well-drained agricultural land is suitable for some varieties of plum. In general, the European varieties grow best on the heavier loams whereas the Japanese and American types thrive on the lighter lands. Adaptation to diverse soil types is possible by the use of suitable stocks.

Propagation is by budding, rarely grafting, on many different seedling stocks, the method being that described for the apple. Myrobalan stock is the most widely employed in both the East and West. Japanese varieties are sometimes worked on peach stocks especially for growth on light soils and in the South. Where hardiness is wanted, some of the American species are used as stocks. Rooted cuttings of the Marianna stock (supposed to be a cerasifera hybrid) find occasional use in the South.

Planting distance for plums of practically every sort is 20 by 20 feet on the square. Small-growing Damsons may succeed with less space and some rank-growing Japanese varieties may profit by a few feet more. Either one- or two-year-old nursery trees are set, usually in early spring.

Tillage and fertilizer, together with cover-cropping, are the same as described for the peach. The plum will endure more neglect than the peach and in home plantings will yield fair crops under sod conditions. Mulching with manure or the application of nitrate of soda, 1 or 2 pounds to the tree in the early spring, will benefit trees in sod. Under thorough cultivation and on good land plum trees rarely show any noticeable response to fertilizers.

Pruning at planting time is essentially that indicated for the apple. After the scaffold limbs are started, little pruning is advisable until the trees come into bearing. The mature trees may be thinned out by removing crowding or crossing limbs and in case the trees are not making vigorous growth or are becoming taller than is desirable the limbs may be headed back, usually cutting to side branches. With some Japanese varieties renewal pruning such as is given the peach but less severe is a good practice. Pruning may be undertaken at any time when the trees are dormant, preferably in late winter or early spring in the East.

Harvesting and marketing of plums are not peculiar. In the fresh state the fruits are carefully hand-picked, usually into small baskets, while the fruit is mature but still firm. For the cannery and jam factory it may be more nearly ripe and for prune making the fruit is allowed to ripen fully and fall from the tree. Tree-ripened fruit is the best for home use. In the East, the standard package for fresh plums is the climax basket in several sizes. The California product is shipped in small wooden baskets, four baskets to a crate. The bulk of the Pacific coast crop is made into prunes.

Yields vary with the variety and care. In the eastern states from 1 bushel to 3 or 4 may be expected from the mature tree under good conditions. On the Pacific coast larger yields are frequent. Although by careful cold storage at 32° F. plums can be held for a month or more in firm condition, such storage is a doubtful practice as usually the flavor is lost. Plums in good condition for marketing are highly perishable and are usually rushed to market under refrigeration. Fresh prunes keep longer than most other plums.

Varieties of plums are many, and one should know to what class or group they belong. Where the European and Japanese kinds can be grown to advantage, it is questionable whether other sorts are worth planting. Many varieties of plums, especially the Japanese and native kinds, do not fruit without other varieties nearby as pollinizers. Varieties are listed in order of ripening. Commercial varieties are starred.

Varieties adapted to the fruit sections of New England, the Hudson Valley and the Great Lakes: Abundance (Japanese), * Burbank (Japanese), Pearl, * Bradshaw, Lombard, Washington, * Italian Prune, Standard Prune, * Grand Duke, Imperial Epineuse, * French Damson, Gold Drop, Jefferson, * Reine Claude.

Hardy native varieties for northern planting: Bixby, Mankato, Opata, Omaha, Cheney, Waneta, Emerald, Brackett, Stoddard.

Varieties for southern Florida and the Gulf coast: Excelsior, Terrell, McRea.

Japanese varieties for southern planting: Red June, Ogon, Bartlett, Abundance, Climax, Burbank, Chabot, Satsuma, Kelsey.

Native varieties for southern planting: Munson, Clifford, Wild Goose, Wilder, Forest Garden, Miner, Wayland.

Varieties for the Pacific coast, Japanese varieties: * Beauty, * Burbank, * Climax, * Duarte, * Formosa, * Kelsey, * Santa Rosa. European varieties: * Agen, Diamond, Golden Drop, Giant, * Grand Duke, Imperial Epineuse, * Italian Prune, Jefferson, * Pond, * Reine Claude, Tragedy.

Pests and diseases are a serious problem with the plum as well as with the peach, particularly curculio and brown-rot. They can be controlled with dry-mix lime-sulfur and lead arsenate as described for the peach. A second or third application may be necessary at intervals of two or three weeks after the first spray. Black-knot, a fungous disease which causes black warty excrescences on the twigs and limbs, may cause serious damage. The only control is to cut out and destroy the affected parts as soon as the disease appears, although the lodgement of the fungus may be somewhat prevented if trees are well sprayed with lime-sulfur.

PLUM, BATOKO-: *Flacourtia indica.* **Burdekin-:** *Pleiogynium Solandri.* **Coco-:** *Chrysobalanus Icaco.* **Date-:** *Diospyros Lotus.* **Governors-:** *Flacourtia indica.* **Hog-:** *Spondias Mombin.* **Jambolan-:** *Eugenia Cumini.* **Japan-:** *Eriobotrya japonica.* **Kafir-:** *Harpephyllum caffrum.* **Marmalade-:** *Achras Zapota.* **Natal-:** *Carissa grandiflora.* **Pigeon-:** *Coccolobis floridana.* **Spanish-:** *Spondias purpurea.*

PLUMBAGINACEÆ. Plumbago or Leadwort Family. Herbs and small shrubs of about 10 widely distributed genera, mostly in the Medit. region and eastward, having certain medicinal uses but mostly grown as ornamental subjects. The family, which is allied to Primulaceæ, is characterized by bisexual regular gamopetalous fls. having 5-toothed calyx which is often ribbed and membranaceous, 5-lobed or -parted corolla, 5 stamens, superior 1-celled ovary, and fr. inclosed by the calyx. Acantholimon, Ceratostigma, Limonium, Plumbago, Statice are herein treated.

PLUMBAGO. Leadwort. *Plumbaginaceæ.* Small shrubs or herbs with alternate entire lvs. and blue, red, or white salver-shaped fls. in terminal spikes; grown out-doors in subtrop. countries and under glass in intermediate temperatures. Propagated by cuttings of nearly mature wood, by division and seeds.

capensis. Partially climbing or upright and straggling: lvs. oblong, to 2 in. long: fls. azure-blue, corolla-tube 1½ in. long, limb to 1 in. or more across. S. Afr.—Common in greenhouses and in the open in warm countries. Var. **alba** has white fls., also common.

coccinea: *P. indica* var.

indica (*P. rosea*). Partially climbing: lvs. ovate-elliptic, to 4 in. long: fls. purplish-red, corolla-tube 1 in. long. S. Asia. Var. **coccinea** has larger scarlet fls.

Larpentæ: *Ceratostigma plumbaginoides.*

rosea: *P. indica.*

scandens. Climbing or trailing: lvs. ovate- or oblong-lanceolate, to 5 in. long: fls. white, corolla-tube to ¾ in. long, limb of corolla ½ in. or less across. Trop. Amer.

PLUMERIA. Frangipani. *Apocynaceæ.* Fleshy-branched deciduous trees and shrubs with very milky sap and alternate long pinnately-veined lvs., large funnelform fls. in terminal cymes, and fr. of 2 leathery follicles; about 50 species in trop. Amer., some of them grown for ornament in warm countries, and for the perfume. Propagated by cuttings in early spring. Fls. mostly appear when trees are leafless.

acuminata (*P. acutifolia*). To 20 ft.: lvs. to 16 in. long and 3 in. wide, glabrous: fls. white, yellow at base, very fragrant. Mex.

acutifolia: *P. acuminata.*

alba. To 35 ft.: lvs. very narrow, to 10 in. long and ½ in. wide, white-pubescent beneath: fls. white, fragrant. W. Indies.

emarginata. Small tree: lvs. to 7 in. long and 3 in. broad, more or less pubescent underneath, shallowly emarginate at apex, the veins at nearly right angles to the midrib and in this respect differing from the closely related Cuban *P. obtusa* in which the veins are strongly ascending: fls. white, with rounded lobes 1 in. or more long (in *P. obtusa* lobes shorter, not known to be in U. S.). Cuba; planted in Fla.

rubra. To 15 ft.: lvs. to 16 in. long and 4 in. wide, glabrous: fls. pink, red or purple, very fragrant. Mex. to Venezuela; nat. in W. Indies.

PLUMOSE: plumy; feather-like; with fine long hairs along the side as the pappus of some composites.

POA. *Gramineæ.* Small ann. and per. grasses employed for lawns and in pastures and meadows, having flat or convolute lvs. and spikelets in open or narrow panicles; of wide distribution in temp. and cold countries. See *Grasses, Lawns.*

alpina. Mountain Spear-Grass. Per. to 1½ ft.: lvs. to 3 in. long and ⅙ in. wide: panicles to 3 in. long, branches spreading. Eu., Asia, N. N. Amer.

bulbosa. Tufted per. to 16 in., sts. bulbously thickened at base: lvs. to 3 in. long and ⅙ in. wide: panicles to 2 in. long. Eu., Asia.

compressa. Canada Blue-Grass. Wire-Grass. Per. to 2 ft., decumbent at base with creeping rootstocks, bluish-green: lvs. to 4 in. long and 1/12 in. wide: panicles to 3 in. long, branches erect or ascending. Eu., Asia; nat. in N. Amer.

nemoralis. Wood Meadow-Grass. Per. to 3 ft.: lvs. to 5 in. long and 1/12 in. wide: panicles open, branches erect or spreading. Eu., Asia.

palustris. Fowl Meadow-Grass. Tufted per. to 5 ft.: lvs. to 6 in. long and ⅙ in. wide, soft: panicles open, to 1 ft. long, nodding, yellowish-green or purplish. Eu., N. N. Amer.

pilosa: *Eragrostis pilosa.*

pratensis. Kentucky Blue-Grass. June-Grass. Tufted per. to 3 ft.: lvs. to 6 in. or more long and ¼ in. wide: panicles to 8 in. long, branches spreading or ascending. Eu., Asia; nat. in N. Amer.

trivialis. Rough-stalked Meadow-Grass. Per. to 3 ft., often decumbent at base: lvs. to 7 in. long and ⅙ in. wide: panicles open, to 6 in. long, branches ascending or spreading. Eu.; nat. in N. Amer.

POD: a dehiscent dry pericarp; a rather general uncritical term.

PODACHÆNIUM. *Compositæ.* Shrubs with large opposite lvs. and small heads of white ray-fls. and yellow disk-fls. borne in panicled corymbs; pappus of bristles and scales; native Mex. to N. S. Amer. and one grown out-of-doors in S. Calif.

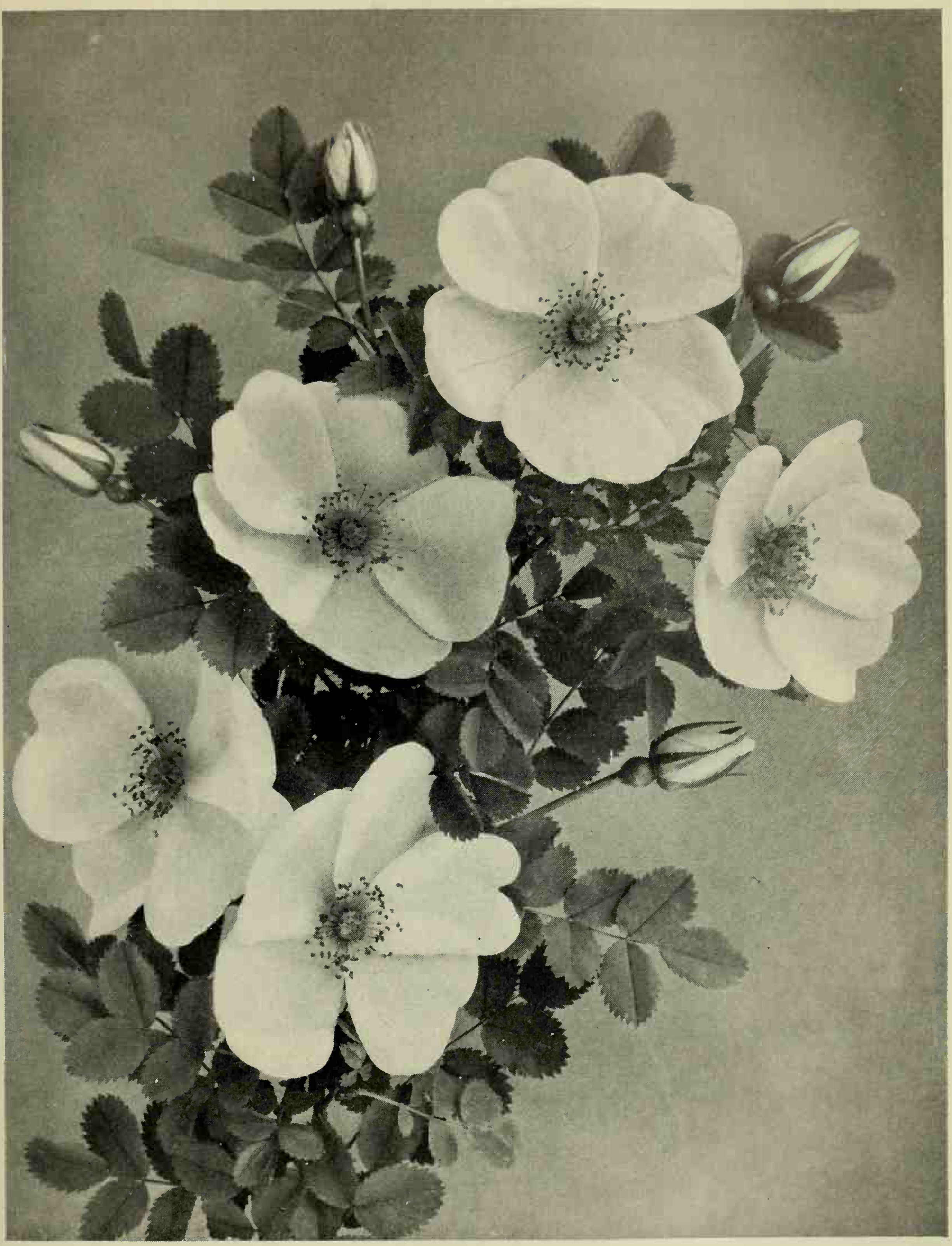
eminens (*Ferdinanda eminens*). To 25 ft.: lvs. ovate or orbicular, to 1 ft. and more long, entire or angular-lobed, gray-tomentose beneath: heads to 1 in. across. Mex., Cent. Amer.

PODALYRIA. *Leguminosæ.* S. African shrubs with alternate simple lvs., purple, rose or whitish papilionaceous fls., and leathery swollen pubescent pods; grown in Calif.

calyptrata. To 6 ft.: lvs. to 1¾ in. long and 1 in. across, pubescent and green on both sides.

sericea. To 6 ft., sometimes procumbent: lvs. oblong, silvery-silky on both sides.

PODOCARPUS. *Taxaceæ.* Evergreen trees or shrubs with flat mostly narrow but sometimes broad lvs., yellow catkin-like male fls. and greenish inconspicuous female



XIII. Rose. — The simple beauty of a single rose, *Rosa spinosissima*

fls., and berry- or drupe-like frs. often on fleshy red or purple stalks; native in the mts. and highlands of warm regions, many of them in the southern hemisphere. For cult., see *Conifers.* The foliage of most of the species does not at first suggest the Coniferæ. The podocarpuses are grown in the open far south in the eastern and central U. S. and in Calif., and sometimes under glass as tub plants.

acutifolia. Much branched shrub to 10 or more ft.: lvs. linear, to 1 in. long, thin. New Zeal.

alpina. Shrub or tree to 15 ft.: lvs. linear, to ½ in. long, pale beneath. Tasmania, Australia.

andina. Tree to 45 ft.: lvs. linear, to 1¼ in. long, with 2 glaucous bands beneath. Chile.

dacrydioides. Tree to 100 ft. or more: lvs. overlapping, to ⅛ in. long or on young trees ¼ in. New Zeal.

elongata. Tree to 70 ft.: lvs. linear-lanceolate, to 3 in. and more long, thin, pointed. S. and trop. Afr.—Prized in S. Calif. in juvenile stage for attractive habit and bright green foliage, as tub and decorative plant.

ferruginea. Tree to 80 ft.: lvs. linear, to ¾ in. long, crowded. New Zeal.

gracilior. Tree to 60 ft.: lvs. linear-lanceolate, to 4 in long and ¼ in. wide. Cent Afr.

Hallii. Tree to 60 ft.: lvs. linear-lanceolate, to 1¼ in. long. leathery. New Zeal.

japonica: *P. macrophylla* var. *Maki.*

longifolia: *P. macrophylla.*

macrophylla (*P. longifolia*). Tree to 60 ft.: lvs. lanceolate, to 4 in. long, glossy dark green above, paler beneath. Japan. Var. **appressa** is a low form with shorter lvs. Var. **Maki** (*P. japonica*) has smaller lvs. and is usually shrubby.—Apparently the commonest species in cult.

Nagi. Tree to 90 ft.: lvs. lanceolate to ovate, to 3 in. long and about 1 in. broad (like Agathis), paler beneath. Japan.

neriifolia. Tree to 70 ft.: lvs. lanceolate, to 6 in. long, slightly glaucous beneath, midrib in a groove. China to New Guinea.

nivalis. Much branched shrub to 8 ft.: lvs. to ⅜ in. long. leathery, with thickened margins. New Zeal.

nubigena. Tree or shrub: lvs. linear-lanceolate, to 1¾ in. long, with 2 glaucous bands beneath. Chile.

saligna. Tree to 60 ft.: lvs. linear-lanceolate, to 4 in. long, blue-green above and pale beneath. Chile.

spicata. Tree to 80 ft., with pendulous branches when young: lvs. linear, to ½ in. long, glaucous beneath, leathery. New Zeal.

spinulosa. Spreading shrub: lvs. linear, to 2½ in. long, stiff, pungent-pointed. Australia.

Totara. Tree to 100 ft.: lvs, linear, to 1 in. long, dull green, leathery. New Zeal.

PODOLEPIS. *Compositæ.* Australian ann. or per. herbs with deciduous tomentum, alternate entire linear to lanceolate lvs., and terminal heads of yellow, pink or purple ray-fls. and disk-fls.; bracts of involucre stiff and showy; pappus of bristles.

Species of podolepis are grown as everlastings and thrive in sunlight in porous soil. Propagated by seed, sown under glass in April or outdoors when the soil is in proper condition.

affinis: *P. canescens.*

aristata (*P. chrysantha*). Ann. to 1 ft.: heads solitary, 1 in. or more across, rays yellow, 3–4-lobed.

canescens (*P. affinis*). Ann. to 1 ft.: heads solitary, about ¾ in. across, rays yellow, 3–4-lobed.

chrysantha: *P. aristata.*

gracilis. Ann. to 1 ft. or more, much branched: rays purple or lilac, entire or 2-lobed, ½ in. long.

PODOPHYLLUM. MAY-APPLE. *Berberidaceæ.* Asian and N. American per. herbs with peltate palmately lobed lvs., solitary white fls., and fr. a fleshy berry; useful for shady places in the wild-garden. A drug is obtained from the rhizomes of the native species. Propagated by division and seed.

emodi. To 1 ft.: lvs. to 10 in. across, 3–5-lobed: fls. to 1½ in. across: fr. red, to 2 in. across, edible. Himalayas.

peltatum. To 1½ ft.: lvs. to 1 ft. across, 5–9-lobed: fls. 2 in. and more across: fr. yellowish, 2 in. long. Que. to Fla. and Tex.

POGONIA. *Orchidaceæ.* Terrestrial orchids with leafy sts. and solitary terminal fls., the sepals and petals nearly similar, the lip entire; grown out-of-doors in shady or moist situations. See *Orchids.*

ophioglossoides. To 16 in., with 2–3 lvs. to 3 in. long: fls. rose, fragrant, June–July. Newf. to Fla. and Tex.

POINCIANA. *Leguminosæ.* Trees or shrubs with 2-pinnate lvs., showy fls. in panicles or racemes, the stamens often long-exerted, and flat pods; native in warm regions. Cult. as for *Cæsalpinia.*

Gilliesii (*Cæsalpinia Gilliesii*). Straggling shrub or small tree, not prickly, branchlets glandular-pubescent: lfts. numerous and very small: fls. light yellow with bright red stamens: pods to 4 in. long. S. Amer.

pulcherrima (*Cæsalpinia pulcherrima*). BARBADOS PRIDE. BARBADOS FLOWER-FENCE. DWARF POINCIANA. More or less prickly glabrous shrub to 10 ft.: lfts. to ¾ in. long: fls. orange or yellow with bright red stamens to 2½ in. long: pods to 4 in. long. Tropics.

regia: *Delonix regia.*

POINSETTIA: *Euphorbia pulcherrima*; culture under *Euphorbia.*

POISON-BULB: *Crinum asiaticum.*

POKE: *Phytolacca americana.*

POKEBERRY: *Phytolacca.*

POKER-PLANT: *Kniphofia.*

POKEWEED: *Phytolacca.*

POLANISIA. *Capparidaceæ.* Rather coarse weedy ann. herbs of warm and trop. countries, probably 30 species, differing from Cleome in the absence of a conspicuous stalk (gynophore) to the ovary. **P. trachysperma** of N. Amer., is sometimes grown as *Cleome gigantea* and *C. grandis* by error or admixture; it is a glandular plant, not showy, with purple and whitish fls. and much shorter stamens than the Cleome.

POLEMONIACEÆ. PHLOX FAMILY. Bland herbs or rarely shrubs or small trees, of about 12 genera in Eu., Asia and N. Amer., characterized by bisexual mostly regular fls. having 5 sepals, 5-lobed gamopetalous corolla, 5 stamens, superior usually 3-celled ovary, and capsular frs. The family furnishes many garden ornamental subjects, as Cantua, Cobæa, Collomia, Gilia, Leptodactylon, Linanthus, Loeselia, Navarretia, Phlox, Polemonium.

POLEMONIUM. *Polemoniaceæ.* Mostly per. herbs with alternate pinnately dissected lvs. and blue, purplish, white or yellowish often nodding fls. in terminal corymbs; grown in the flower-garden or border. Of easy cult. in rich loam. Propagated by division or seeds sown in fall.

cæruleum. JACOBS-LADDER. GREEK VALERIAN. CHARITY. To 3 ft.: lvs. of 11-21 lanceolate lfts.: fls. blue, 1 in. across, drooping. Eu. Var. album has white fls. Var. **himalayanum** (*P. grandiflorum*) has lilac-blue fls. to 1½ in. across. In var. variegatum the foliage is variegated.

carneum. To 2 ft.: lvs. of 5–17 ovate to oblong-lanceolate lfts. to 1½ in. long: fls. salmon fading purplish, to 1½ in. across. Calif., Ore.

confertum. SKUNKWEED. To 8 in.: lvs. of 30–40 orbicular or oblong lfts.: fls. blue or violet, 1 in. long. Mts. Wyo. to New Mex.

elegans. To 6 in., viscid: lfts. numerous, ovate to elliptic, very small: fls. blue with yellow throat, about ½ in. long. Wash.

filicinum. To 3 ft. or more: lvs. fern-like, the lfts. lanceolate: fls. deep blue or purple, ½ in. across. New Mex.

flavum. To 3 ft.: lvs. of ovate to oblong-lanceolate lfts.: fls. tawny-red outside, yellow inside, about 1 in. across. Mts. of New Mex.

grandiflorum: *P. cæruleum* var. *himalayanum.*

himalayanum: *P. cæruleum* var.

humile (*P. Richardsonii*). To 9 in.: lvs. of 15–21 round-oval to oblong lfts: fls. blue or purplish, ½ in. across. Arctic regions. Var. **album** has white fls. Var. **pulchellum** (*P. pulchellum*) has smaller violet to white fls.

mellitum. To 10 in.: lvs. of 30–60 oval to linear lfts.: fls. white or cream, 1 in. long. Rocky Mts.

molle. To 2 ft., hairy: lvs. of 13–21 oblong or lanceolate lfts.: fls. purple, ½ in. long. Rocky Mts.

occidentale. To 3 ft., glandular-pubescent: lvs. of 15–27 ovate-oblong or lanceolate lfts. to 1½ in. long: fls. blue or violet, ½ in. long. Alaska to Colo. and Calif.

pauciflorum. To 1 ft., glandular-pubescent: lvs. of 12–24 narrow-lanceolate lfts. ¾ in. long: fls. yellow tinged red, 1½ in. long, sometimes solitary. Mex.

pulchellum: *P. humile* var.

reptans. To 1 ft.: lvs. of 5–15 ovate to lanceolate-oblong lfts.: fls. light blue, to ¾ in. long. N. Y. to Ala. and Kans.

Richardsonii: *P. humile.*

robustum. To 3 ft.: lvs. of 11–17 lanceolate lfts.: fls. rose or purplish, to ⅗ in. long. Mts. of Colo.

viscosum. To 4 in., sticky-pubescent: lvs. of 30–41 orbicular lfts. to ⅙ in. long: fls. blue or violet, ¾ in. long. Mts. Alta. to Ida.

POLIANTHES. *Amaryllidaceæ.* Mexican herbs with tuberous roots, grass-like basal and st.-lvs. and white fls. in terminal racemes or spikes, the perianth-tube long.

Tubers or bulbs should be set out early in June and covered with about an inch or more of fine light soil. One, the tuberose, is a popular garden plant. The roots should be dug before frost and stored over winter in a dry warm place. Tuberoses are summer and autumn bloomers; they may be forced for bloom in April to June by starting in January and kept in a temperature of 75–80°. The bulbs may be retarded in a cool dry place and forced for November bloom.

tuberosa. TUBEROSE (that is, tuber-ose). To 3½ ft.: lvs. to 1½ ft. long and ½ in. wide, those on the st. clasping and successively smaller: fls. waxy-white, very fragrant, 2½ in. long, the double form mostly planted. Unknown wild.

POLIOTHYRSIS. *Flacourtiaceæ.* One Chinese tree adaptable far S. Propagated by seeds, cuttings of green wood and roots. **P. sinensis.** To 40 ft.: lvs. ovate or ovate-oblong, to 7 in. long, toothed: fls. monœcious, greenish-white, small, without petals, in terminal panicles to 8 in. long: caps. ¾ in. long.

POLLEN: spores or grains borne by the anther, containing the male element; sometimes, as in orchids and milkweeds, it is not granular.

POLLIA. *Commelinaceæ.* Per. herbs native in the tropics of the Old World, having large lvs. borne near the top of the st. and white or pale rose fls. in terminal panicles; sometimes found in greenhouse collections. Requires the treatment of other glasshouse spiderworts.

condensata. Sts. to 6 ft.: lvs. to 1 ft. long and 3 in. wide. Trop. Afr. Var. variegata has lvs. variegated with yellowish-white.

POLYANDROCOCOS. *Palmaceæ.* Two tall unarmed monœcious Brazilian feather-palms, one of which has been planted in Fla.; spadix among the lvs., long and simple, staminate in the upper part; stamens 15–20; pistillate fls. subtended by bracts that enlarge in fr., making a close cylindrical spike: fr. ellipsoid or obovoid, concave at apex. For cult. see *Palm.*

caudescens (*Diplothemium caudescens*). Trunk to 20 ft., closely ringed, bearing a heavy dense crown of stiff foliage: pinnæ very many, 2 in. or less broad, with very strong midrib and other nerves faint, somewhat crenate near the point: stamens 90–120: fr. obovoid, about ¾ in. long, punctate, pubescent in apical cavity. Bahia to Espirito Santo.

POLYANTHUS: *Primula polyantha.*

POLYCALYMMA: *Myriocephalus Stuartii.*

POLYCODIUM: *Vaccinium stamineum.*

POLYGALA. MILKWORT. *Polygalaceæ.* Herbs or shrubs planted out-of-doors in warm climates or grown in the greenhouse, and some of them native in N. Amer.; characters of *Polygalaceæ,* which see.

Some species may be transplanted from the wild and these should mostly be placed in shady situations in light soil; propagated by seed. The tender species are propagated by cuttings in spring, over heat.

alba. Ann. or bien. to 1½ ft.: lvs. linear, to 1 in. long: fls. white, in spike-like racemes. Minn. to Mex.

apopetala. Shrub to 15 ft. or more: lvs. lanceolate, obtuse: fls. pinkish-purple, in terminal racemes. Lower Calif.—Planted on Pacific coast.

brachypoda. Erect: fls. reddish-purple, in racemes. Native country unknown.

Chamæbuxus. Creeping evergreen shrub to 1 ft.: lvs. lanceolate to obovate, to 1 in. long: fls. yellow, 1 or 2 together. Eu.; stands in S. New England. Var. grandiflora (var *purpurea*) has purple wings and yellow petals.

Dalmaisiana. A hybrid with *P. myrtifolia* var. *grandiflora* as one parent: fls. purplish- or rosy-red, blooming almost continuously.—Greenhouse bush, planted out far S. and in Calif.

grandiflora: *P. myrtifolia* var.

myrtifolia. Shrub to 8 ft.: lvs. oblong or obovate, to 1 in. long: fls. greenish-white veined with purple, the lower petal with a conspicuous fringed crest, borne in short terminal racemes. S. Afr.—Greenhouse, or in the open in warm regions. Var. **grandiflora** (*P. grandiflora*) has large rich purple fls.

paucifolia. FRINGED P. FLOWERING WINTERGREEN. Per. trailer to 6 or 7 in.: upper lvs. clustered and ovate or oblong, lower ones distant and becoming scale-like: fls. rose-purple or rarely white, 1–4 together, appearing terminal, with conspicuous fringed crest on corolla. N. B. to Ga. and Minn.; sometimes colonized about woods.

polygama. Bien. to 1½ ft.: lvs. spatulate to oblong, to 1 in. long: fls. purple or rose, ¼ in. long, in loose racemes to 4 in. long. N. S. to Fla. and Tex.

Senega. SENECA SNAKEROOT. Per. to 1½ ft.: lvs. lanceolate or oblong-lanceolate, to 2 in. long: fls. white or greenish, very small, in terminal spikes to 2 in. long. N. B. to N. C. and Ark.

virgata. Shrub to 15 ft.: lvs. linear: fls. purple or pink, in many-fld. leafless racemes. S. Afr.—Planted sometimes in warm regions.

POLYGALACEÆ. Milkwort Family. Herbs, shrubs or trees, sometimes climbing, of about 10 widely distributed genera, Comesperma, Polygala and Securidaca being known as cult. subjects. The family is characterized by simple lvs., bisexual irregular fls. with 5 sepals of which 2 resemble petals, 3–5 petals often united, 8–10 stamens, superior 2-celled ovary, and fr. usually a caps. but sometimes a samara or drupe. Grown somewhat for ornament.

POLYGAMOUS: bearing unisexual and bisexual flowers on the same plant or in the same infloresence; a sexually mixed inflorescence.

POLYGONACEÆ. Buckwheat or Knotweed Family. About 40 widely distributed genera of herbs, vines, shrubs or trees having jointed sts., simple lvs. with stipules usually united into a prominent more or less tubular sheath or ocrea, and small bisexual or unisexual fls. without petals and with 2–6-parted calyx, 2–9 stamens, superior 1-celled ovary, and fr. an achene. A few genera yield food products and others are cult. for ornament, as Antigonon, Atraphaxis, Calacinum (Muehlenbeckia), Coccolobis, Eriogonum, Fagopyrum, Homalocladium, Polygonum, Rheum, Rumex, Tovara, Triplaris.

POLYGONATUM (*Salomonia*). Solomons-Seal. *Liliaceæ.* Per. herbs of north temp. zone with creeping roots, sts. leafy toward the top, and greenish drooping fls. solitary or in umbels in the axils, the perianth-segms. united; suitable for the wild-garden. They thrive in shady positions in deep rich soil. Propagated by division.

biflorum. To 3 ft.: lvs. to 4 in. long and 2 in. wide, pubescent beneath: fls. 1–4 together, to ½ in. long. N. B. to Fla. and Tenn. Var. **majus** is a large form.

commutatum (*P. giganteum*). To 8 ft.: lvs. to 6 in. long and 4 in. wide, glabrous: fls. 1–8 together, ¾ in. long. N. Amer.

giganteum: *P. commutatum.*

latifolium. To 4 ft.: lvs. to 6 in. long: fls. 1–5 together, ¾ in. long. Eu.

majus: *P. biflorum* var.

multiflorum. To 3 ft.: lvs. 3 in. long and 1½ in. wide, glabrous: fls. 2–8 together, ⅔ in. long. Eu., Asia.

POLYGONUM. Knotweed. Fleece-Flower. *Polygonaceæ.* Mostly herbs, sometimes twining or aquatic, with alternate simple lvs., small fls. in racemes, spikes or heads, and fr. a small achene; grown in borders or the wild-garden. Many species of varied character, in many parts of the world, a few of the kinds of good ornamental value for their profusion of little white, greenish or red fls. and sometimes for the abundant foliage. Of easy cult. Propagated by seeds and division.

affine (*P. Brunonis*). Per. to 1½ ft.: lvs. mostly basal, oblanceolate, 6 in. or more long, finely toothed: fls. bright rose-red, in dense spikes to 3 in. long, in autumn. High Himalayas.

alpinum. Per. to 3 ft.: lvs. lanceolate to ovate-lanceolate, to 6 in. long, ciliate on margins: fls. white, in panicled racemes, in summer. Alps and Asia.

amphibium (*Persicaria amphibia*). Aquatic per. with st. to 20 ft. long which roots at joints: lvs. rather thick, floating, oblong to lanceolate, to 4 in. long: fls. light rose, in dense terminal racemes to 1 in. long, in late summer. In ponds and lakes, N. Amer. and Eu.; sometimes nat. in pools.

amplexicaule. Mountain Fleece. Per. to 3 ft.: lvs. ovate to lanceolate, to 6 in. long, the upper st.-clasping: fls. rose-red or white, in spikes to 6 in. long, in mid-summer. Himalayas.

Auberti. China Fleece-Vine. Silver Lace-Vine. Twining per. vine to 20 ft.: lvs. ovate-lanceolate, to 2½ in. long: fls. greenish, fragrant, in long erect panicled racemes, in late summer. W. China, Tibet.

baldschuanicum. Closely resembling *P. Auberti* but with larger rose-colored fls. in denser drooping panicles. Bokhara.

Bistorta. Snakeweed. Per. to 2 ft.: lvs. basal and cauline, oblong-ovate, truncate at base, with long winged petiole: fls. white or pink, in a dense spike to 2 in. long, in late summer. N. Eu. and Asia.

bistortoides (*Bistorta bistortoides*). Per. to 2½ ft.: lvs. mostly basal, oblong or lanceolate, to 10 in. long: fls. white, in dense racemes to 2 in. long. B. C. to Calif. and Rocky Mts.—Differs from *P. Bistorta* in the longer narrower lvs. commonly tapering into unwinged petioles.

Brunonis: *P. affine.*

capitatum. Per. with trailing branches to 10 in. long: lvs. elliptic, to 1½ in. long: fls. pink, in dense heads to ¾ in. across. Himalayas.

compactum: *P. cuspidatum* var.

cuspidatum. Per. to 8 ft.: lvs. oval to nearly orbicular, to 5 in. long, abruptly pointed: fls. small, greenish-white, in axillary panicled racemes, in late summer and autumn. Japan. Var. **compactum** is a condensed form about 2 ft. high.—The name *cuspidatum* was employed earlier in the genus but is apparently an undetermined or dead name and under the International Rules does not invalidate the present use of it; under other interpretation, however, the name cannot be employed again and both *P. Sieboldi* and *P. Zuccarinii* have been used instead.

filiforme: *Tovara virginiana* var. *filiformis.*

multiflorum. Climber, with tuberous root: lvs. cordate-ovate, 2–5 in. long, evergreen in mild climates: fls. greenish, in slender panicles, in autumn. Japan.

orientale (*Persicaria orientalis*). Princes-Feather. Hairy ann. to 6 ft.: lvs. broadly ovate, to 10 in. long: fls. bright pink or rose, in dense spikes to 3½ in. long, in autumn. Asia, Australia; nat. in N. Amer.

Persicaria. Ladys-Thumb. Ann. to 2 ft.: lvs. lanceolate or narrower, usually with triangular spot near middle: fls. pink or greenish-purple, in dense spikes to 2 in. long, in summer. Eu.; nat. in N. Amer.

polygaloides. Ann. to 8 in.: lvs. narrow-linear, to 1 in. long: fls. white or pinkish, the bracts with white petal-like margins. Wash. to Mont.

polystachyum. Shrubby per. to 6 ft.: lvs. oblong-lanceolate, to 9 in. long and 3½ in. wide: fls. white or pink, in large terminal panicles, in autumn. Himalayas.

sachalinense. Sacaline. Coarse per. to 12 ft.: lvs. oval-oblong, 1 ft. and more long, slightly heart-shaped at base: fls. greenish, in short axillary clusters, in autumn. Saghalin Isl.—Sometimes grown for rough forage or as a coarse cover or screen.

scandens. Twining per.: lvs. ovate, to 5 in. long: fls. greenish-yellow, in axillary leafy racemes to 10 in. long. N. S. to Fla. and La.

sericeum: the plant grown under this name is *P. alpinum.*

Sieboldi: see *P. cuspidatum.*

vaccinifolium. Per. to 1 ft. with trailing branches: lvs. orbicular, to ⅔ in. long, slightly glaucous beneath: fls. rose, ⅓ in. across, in racemes to 3 in. long. Himalayas.

virginianum: *Tovara virginiana.*

viviparum (*Bistorta vivipara*). Per. to 1 ft.: lvs. oblong to linear, to 8 in. long: fls. pale rose or white, in narrow terminal racemes. N. Amer., Eu., Asia.

Weyrichii. Per. to 3 ft.: lvs. ovate, to 7 in. long, white-tomentose beneath: fls. white or greenish, in racemes forming a large terminal panicle. Saghalin.

Zuccarinii: see *P. cuspidatum.*

POLYMNIA GRANDIS: *Montanoa bipinnatifida.*

POLYPETALOUS: having several distinct (separate) petals.

POLYPODIACEÆ. Common-Fern Family. Most of the common low ferns without distinct trunks, planted in the open and grown under glass, belong to this variable family of wide distribution: fronds or lvs. simple or pinnate, or palmate in some species, bearing sori on backs or margins, usually covered with an indusium. The most important genera known to hort. are Adiantum, Anopteris, Asplenium, Athyrium, Blechnum, Camptosorus, Cheilanthes, Coniogramme, Cryptogramma, Cyclophorus, Cyrtomium, Cystopteris, Davallia, Dennstaedtia, Diplazium, Doodia, Doryopteris, Dryopteris, Elaphoglossum, Hemionitis, Humata, Hypolepis, Microlepia, Nephrolepis, Odontosoria, Onoclea, Onychium, Pellæa, Phyllitis, Pityrogramma, Platycerium, Polypodium, Polystichum, Pteretis, Pteridium, Pteris, Sadleria, Stenochlæna, Struthiopteris, Woodsia, Woodwardia. For cult. see *Ferns.*

POLYPODIUM. Polypody. *Polypodiaceæ.* A great genus of ferns growing in all parts of the world, of various habit and often epiphytic: lvs. simple or compound; sori naked, on backs of veins. Some of the species are good in the rock-garden, others are tropical and therefore greenhouse subjects of diverse kinds but mostly easy to grow. A number of them are root-climbers. Propagation is by spores, and readily by division of clumps or rhizomes. See *Ferns.*

aureum (*P. glaucum. Phlebodium aureum*). Hares-foot-Fern. Golden P. Coarse fern with brown-scaly rhizomes: lvs. to 4 ft. long and 1 ft. wide, deeply cut or pinnate, segms. to 1 ft. long and 2 in. wide, often glaucous beneath. Trop. Amer.

diversifolium. Lvs. leathery, of two forms, about 9 in. long and 2 in. wide and entire, or to 1½ ft. long and 9 in. wide and deeply pinnatifid, segms. to 5 in. long. New Zeal., Australia, Tasmania.

Dryopteris: *Dryopteris Linnæana.*

falcatum: *P. glycyrrhiza.*

fraxinifolium. Ashleaf P. Lvs. to 4 ft. long and 1½ ft. wide, pinnate, segms. entire, to 9 in. long. Colombia to Brazil and Peru.

glaucophyllum crispum: form of *P. aureum.*

glauco-pruinatum (*P. glaucum. Phymatodes glaucum*). Lvs. to 1½ ft. long and 8 in. wide, deeply pinnatifid, segms. entire, ½ in. or more wide. Philippine Isls.

glaucum: *P. aureum* or *P. glauco-pruinatum.*

glycyrrhiza (*P. falcatum. P. vulgare* var. *occidentale*). Licorice-Fern. Lvs. pinnate, to 1½ ft. long and 7 in. wide, segms. to 2½ in. long. Calif. to Alaska.

hexagonopterum: *Dryopteris hexagonoptera.*

incanum: *P. polypodioides.*

irioides. Lvs. to 3 ft. long and 3 in. wide, entire, leathery. Trop. Asia, Afr., Pacific Isls.

Knightiæ: hort. form of *P. subauriculatum.*

Lingua: *Cyclophorus Lingua.*

Lowi: a form of *P. aureum.*

Mandaianum: a wavy-lvd. form of *P. aureum.*

Palmeri. Rhizomes very thick, white-scaly: lvs. to 8 in. long and 3 in. wide, the fertile smaller, oblong to linear, entire. Mex. to Panama.

pennigerum: *Dryopteris pennigera.*

percussum (*Phymatodes percussum*). Lvs. to 1 ft. long and 1½ in. wide, entire, narrowed toward both ends, very leathery. Colombia to Peru and Brazil.

Phegopteris: *Dryopteris Phegopteris.*

Phyllitidis (*Campyloneuron Phyllitidis*). Strap-Fern. Lvs. to 3 ft. long and 4 in wide, simple, leathery, shining, sometimes wavy-margined. Fla. to Brazil.

Phymatodes (*Drynaria vulgaris. Phymatodes vulgaris*). East Indian P. Similar to *P. aureum* but with slender blackish rhizomes, smaller lvs. and different venation. Asia, Afr.

polypodioides (*P. incanum*). Resurrection-Fern. Lvs. evergreen, leathery, to 7 in. long and 2 in. wide, pinnatifid into oblong entire segms., gray-scaly beneath. On trees Pa. to Tex., trop. Amer.

pustulatum. Lvs. variable. to 9 in. long and ⅔ in. wide and entire, or to 1½ ft. long and 6 in. wide and deeply pinnatifid into linear-lanceolate segms. to 3 in. long. New Zeal., Australia.

quercifolium (*Drynaria quercifolia*). Oak-leaved-Fern. Lvs. leathery, of two kinds; fertile long-stalked, to 3 ft. long, pinnatifid into oblong entire segms. to 9 in. long; sterile sessile, shape of oak lvs., to 1 ft. long and 8 in. wide, lobed. India, Malaya to Australia.

Reinwardtii: a hort. form of *P. subauriculatum.*

Scouleri. Lvs. to 1½ ft. long, leathery, pinnate into segms. to ¾ in. wide, slightly wavy. Coast, B. C. to Calif.

subauriculatum (*Goniophlebium subauriculatum*). Jointed P. Lvs. to 3 ft. long and 1 ft. wide, pinnate into entire or toothed segms. to 6 in. long and ½ in. wide. Trop. Asia to Australia.

venosum: a name of uncertain application.

virginianum. American Wall-Fern. Formerly included in *P. vulgare* but rhizomes not sweet, lvs. smaller, the lower segms. as long as or longer than middle ones. E. N. Amer., on cliffs and rocks, north to Labrador.

vulgare. Common P. Wall-F. Forming mats, rhizomes sweet: lvs. to 2 ft. long and 5 in. wide, deeply pinnatifid into segms. to 2 in. wide, the lowest usually shorter than middle ones. On rocks, banks and trees, Eu., Asia, W. N. Amer.—There are many crested, dissected and plumed forms.

POLYPODY: *Polypodium.* **Limestone:** *Dryopteris Robertiana.*

POLYPOGON. *Gramineæ.* Mostly annuals with flat lvs. and spikelets borne in spike-like panicles; native in temp. regions and one sometimes planted for the ornamental fluffy spikes. See *Grasses.*

monspeliensis. Annual Beard-Grass. Ann. to 2 ft.: lvs. to 6 in. long and ¼ in. wide, rough: panicles to 4 in. long, dense, awns to ¼ in. long. Eu., Asia; nat. in N. Amer.

POLYPTERIS. *Compositæ.* Erect branching herbs with entire alternate lvs. and rose-purple or flesh-colored radiate heads in loose panicles; pappus of scales; native in N. Amer. One sometimes cult.

Hookeriana (*Palafoxia Hookeriana. Othake Hookerianum* and *O. sphacelatum*). Ann. to 4 ft., sticky above: lvs. lanceolate, to 4 in. long, rough: heads 1 in. or more across, rays rose-red, deeply 3-lobed, the bracts of involucre tipped purple. Neb. to Mex.

POLYSCIAS. *Araliaceæ.* Aromatic shrubs and trees from tropics of Old World and Pacific, with pinnate exceedingly variable lvs., very small fls. in umbels or heads which are often panicled, and berry-like frs.

These araliads are planted in greenhouses and out-of-doors far South, being much employed in tropics for hedges and division plantings. Of easy cultivation. Propagated mostly by cuttings of firm wood; also by eye-cuttings over heat. Old stools placed over bottom heat will yield cuttings which may be rooted in heat. Cleft- or wedge-grafting is also employed.

Balfouriana (*Aralia Balfouriana*). To 25 ft.: lvs. usually of 3 orbicular coarsely toothed lfts. to 4 in. across, somewhat heart-shaped at base, often blotched with white at the margin. New Caledonia.

filicifolia (*Aralia filicifolia*). To 8 ft.: lvs. 1-pinnate, on the same plant the lfts. varying from oblong and entire, to 7 in. long, to very narrow, pinnatifid and sharply toothed, and to 1 ft. long. Pacific Isls.

fruticosa (*Aralia fruticosa*). To 8 ft.: lvs. at least 3-pinnate, the lfts. varying from narrowly ovate to lanceolate, to 4 in. long, toothed or deeply cut. India to Polynesia. Var. **plumata** has small, very fine and narrow lfts.

Guilfoylei (*Aralia Guilfoylei*). To 20 ft.: lvs. 1-pinnate, the ovate to orbicular lfts. remotely toothed, to 5 in. long, usually margined or blotched with white. Polynesia. There are many leaf-forms, the most important being var. **laciniata** with the white margins cut into pronged teeth, var. **monstrosa** (*Aralia monstrosa*) with lfts. irregularly cut and jagged, and var. **Victoriæ** (*Aralia Victoriæ*) having much divided and cut lfts.

obtusa. Tree to 12 ft.: lvs. bipinnate, glabrous; lfts. small, nearly orbicular, rounded or truncate or subcordate at base, sharp-toothed or cut, perhaps variegated. Java; grown in S. Fla. and southward.

POLYSTACHYA. *Orchidaceæ.* Epiphytic orchids with leafy sts. and small fls. in terminal panicles or racemes, the lateral sepals united, the lip 3-lobed and united to base of column. See *Orchids* for cult.

affinis (*P. bracteosa*). Lvs. thin, to 8 in. long: fls. golden-yellow striped with brown, in many-fld. panicles to 1 ft. high, July–Aug. W. Afr.

bracteosa: *P. affinis.*

luteola (*P. minuta*). To 14 in.: lvs. to 1 ft. long and 1 in. wide: fls. greenish-yellow, in many-fld. panicles to 1 ft. high. Trop Amer.

minuta: *P. luteola.*

POLYSTICHUM. *Polypodiaceæ.* Mostly woods ferns of temp. regions, with lvs. pinnatifid to 4-pinnate into sharp-toothed segms.; sori round, covered by indusia. Here are included some of the ferns formerly known as Aspidium. The native species are sometimes transferred to grounds; others are cool greenhouse subjects of easy cult. See *Ferns.*

acrostichoides (*Aspidium* and *Dryopteris acrostichoides*). CHRISTMAS-FERN. DAGGER-FERN. Hardy: lvs. evergreen. to 2 ft. long and 5 in. wide, 1-pinnate into linear-lanceolate segms., those bearing spores contracted. N. S. to Tex.

aculeatum (*Aspidium aculeatum. Dryopteris aculeata. P. angulare*). Hardy, dark green: lvs. to 2 ft. long and 6 in. wide, 1-pinnate into pinnatifid segms. Widely distributed in Old World and S. Amer.—Very variable. Var. **proliferum** (*P. proliferum*) is a proliferous form.

adiantiforme (*P. capense. P. coriaceum*). Lvs. triangular, leathery, to 3 ft. long and 2½ ft. wide, 1–3-pinnate, segms. oblong, to 1 in. long, coarsely toothed. Tropics.

angulare: *P. aculeatum.*

aristatum (*Aspidium aristatum. Lastrea aristata*). EAST INDIAN HOLLY-FERN. Stalks to 1½ ft. long: lvs. to 2 ft. long and 1 ft. wide, 1–3-pinnate, segms. pinnatifid and spiny-toothed. Asia to Australia. Var. **variegatum** has segms. banded with whitish-green.

Braunii (*Aspidium Braunii*). SHIELD-FERN. Hardy: lvs. to 2 ft. long, 2-pinnate, segms. sharp-toothed, covered with hair-like scales. N. N. Amer., Eu.

californicum (*Aspidium californicum*). Lvs. to 2½ ft. long and 8 in. wide, 1-pinnate into pinnatifid linear segms. Wash. to Calif.

capense: *P. adiantiforme.*

coriaceum: *P. adiantiforme.*

falcatum: *Cyrtomium falcatum.*

lobatum (*P. aculeatum* var. *lobatum*). Differs from *P. aculeatum* in somewhat shining lvs. distinctly tapering to base, mostly sessile pinnules at an acute angle to rachis, the lowest considerably larger than one next to it.

Lonchitis (*Aspidium Lonchitis*). MOUNTAIN HOLLY-FERN. Hardy: lvs. leathery, evergreen, to 2 ft. long, 1-pinnate into lanceolate segms. to 1½ in. long, spiny-toothed and strongly auricled at base. Mts. N. Amer., Eu., Asia.

montanum: *Dryopteris oreopteris.*

munitum (*Aspidium munitum*). GIANT HOLLY-FERN. Hardy: stalks to 2 ft. long: lvs. leathery, evergreen, to 3½ ft. long and 10 in. wide, 1-pinnate into linear sharp-toothed or cut segms. Alaska to Mont. and Calif.

proliferum: *P. aculeatum* var.

setosum: a name of uncertain application.

tsus-simense (*Aspidium tsus-simense*). Small and suitable for fern-baskets: lvs. thin, 2-pinnate, to 2 ft. long including the stalk. Japan.

varium. JAPANESE HOLLY-FERN. St. partly creeping: lvs. to 2 ft. long and 1 ft. wide, 2–3-pinnate, somewhat leathery. China, Japan.

POMADERRIS. *Rhamnaceæ.* Shrubs and trees of the Australia-New Zeal. region with alternate simple lvs., small greenish fls. in cymes, corymbs or panicles, and little capsular frs.; grown for ornament in the S. and Calif. Propagated by cuttings of half-ripened shoots under glass.

apetala. To 20 ft.: lvs. oblong, to 4 in. long, white-tomentose beneath, rusty on veins: fls. greenish-white, in panicles to 7 in. long, without petals. Australia, New Zeal.—Planted as a yard and street tree in Calif.

Edgerleyi. To 4 ft., sometimes procumbent: lvs. oblong, to 1 in. long, rusty-tomentose beneath, bristly above: fls. in cymes, without petals. New Zeal.—Planted in Calif.

elliptica. To 8 ft.: lvs. oblong, to 3 in. long, white-tomentose beneath: fls. bright yellow, ¼ in. across, in much branched panicles, with petals. New Zeal.

lanigera. Tall shrub: lvs. oblong or ovate-lanceolate, to 3 in. long, soft-tomentose beneath: fls. in panicles, with petals. Australia.

phylicæfolia. To 4 ft.: lvs. linear or linear-oblong, to ⅓ in. long, margins revolute to midrib, rough-hairy above: fls. in small cymes, without petals. New Zeal.

rugosa. To 8 ft.: lvs. oblong-lanceolate, to 1½ in. long, pubescent beneath, rusty on veins: fls. in cymes, without petals. New Zeal.

POME is from the Latin *pomum*, fruit; the English word, however, designates a particular kind of fruit represented by apples, pears, quinces, having a peculiar morphological structure: the ovary is immersed in a thick outer part described as an adnate calyx or hollow receptacle, and this part supplies most of the edible flesh; in prevailing cases the outer part completely covers the carpels, only the old styles protruding at the apex when the fruit is mature, but in the medlar the carpels are exposed on top. In *pomology* the Latin element retains its original signification, the word meaning the subject and practice of fruit-growing, whether the fruits are pomes, grapes, berries, avocados, citrus, nuts, plums, persimmons, dates.

POMEGRANATE: *Punica Granatum.*

POMELO: *Citrus paradisi*; see *Citrus Fruits* (page 156).

POMERACK: *Eugenia malaccensis.*

POMME BLANCHE: *Psoralea esculenta.*

POMPELMOUS: *Citrus maxima.*

PONCIRUS. *Rutaceæ.* One small stiff-growing spiny deciduous tree of China, grown for ornament and hedges in the southern states and in protected places as far north as Philadelphia and much employed as stock for citrus fruits to improve their hardiness. **P. trifoliata** (*Citrus trifoliata*), TRIFOLIATE-ORANGE, blooms in spring on bare branches in axils of large spines, the fls. white, opening flat, and sometimes 2 in. across: lfts. 3, oval or oblong, to 2 in. or more long, petiole winged: fr. small but orange-like and aromatic, to 2 in. diam., downy, pulp scant and acid.—A parent in hybridization: see *Citrus Fruits*. Propagated by seeds.

POND-APPLE: *Annona glabra*. -Weed, Cape: *Aponogeton distachyus*.

PONGAMIA. *Leguminosæ*. One tree to 40 ft., grown for ornament in S. U. S., and the seeds furnishing an oil. **P. pinnata** (*P. glabra*). KARUM or POONGA OIL TREE. Lvs. pinnate, of 5–7 ovate lfts. to 4 in. long, strong-smelling: fls. papilionaceous, purplish, pink to white, in loose racemes to 5 in. long: pods woody, thick and flat, to 2 in. long and 1 in. across. Trop. Asia, Australia.

PONGELION: *Ailanthus*.

PONTEDERIA. *Pontederiaceæ*. American aquatic per. herbs with thick parallel-veined lvs. having long petioles and blue fls. in spikes; grown in ponds and bog-gardens. The water should be about 1 ft. deep. Propagated by division.

cordata. PICKEREL-WEED. To 4 ft., from a rootstock: lvs. to 10 in. long and 6 in. wide, heart- or arrow-shaped at base: fls. with upper lobe having 2 yellow spots. N. S. to Fla. and Tex.

PONTEDERIACEÆ. PICKEREL-WEED FAMILY. Six genera native in swamps or ponds: lvs. various: fls. bisexual, somewhat irregular, having 6-parted corolla-like usually showy perianth, 3 or 6 stamens, and superior ovary: fr. a caps. or achene. Eichhornia and Pontederia are grown in ponds and tanks.

POONGA OIL TREE: *Pongamia pinnata*.

POOR MANS WEATHERGLASS: *Anagallis arvensis*.

POPINAC: *Acacia Farnesiana*. **White:** *Leucæna glauca*.

POPLAR: *Populus*; see *Liriodendron Tulipifera*.

POPPY: *Papaver, Meconopsis*. **Bush-:** *Dendromecon rigida*. **California-:** *Eschscholzia californica*. **Celandine-:** *Stylophorum diphyllum*. **Horned-:** *Glaucium*. **Matilija-:** *Romneya Coulteri*. **Mexican Tulip-:** *Hunnemannia fumariæfolia*. **Plume-:** *Macleaya cordata*. **Prickly-:** *Argemone*. **Sea-:** *Glaucium*. **Snow-:** *Eomecon chionantha*. **Tree-:** *Dendromecon rigida*. **Water-:** *Hydrocleys nymphoides*.

POPULUS. POPLAR. ASPEN. COTTONWOOD. *Salicaceæ*. Diœcious trees and bushes with soft white wood, widely distributed in the northern hemisphere, having alternate long-stalked lvs. and fls. in drooping catkins before the lvs., the seeds surrounded by copious silky hairs; widely planted for avenues, windbreaks and ornament. The term cottonwood is applied mostly to *P. balsamifera* and associates, as *P. Sargentii*, *P. Fremontii*, *P. Wislizenii*; the pistillate tree becomes offensive from the "cotton" discharged from the capsules.

Poplars are of easy cultivation in almost any soil and are of prompt and rapid growth. The roots are likely to stop drains or cause heaving of sidewalks, so should be planted with caution. Propagated by hardwood cuttings, suckers, or sometimes by seeds, and the weeping sorts are grafted on the upright forms.

acuminata. To 45 ft.: lvs. rhombic-lanceolate, to 4 in. long, broadly cuneate at base, glossy dark green above, light green beneath. Sask. to Colo.

adenopoda. CHINESE A. To 75 ft. or more: lvs. ovate, to 4 in. or more long, truncate or heart-shaped at base, pale green below with grayish pubescence at least when young. China.

alba. WHITE P. ABELE. To 90 ft. or more: lvs. ovate, to 5 in. long, palmately 3–5-lobed or -toothed, rounded or slightly heart-shaped at base, white- or gray-tomentose beneath. Eu., Asia. Var. **globosa** is a small form with dense oval head. Var. **nivea** has lobed lvs. densely white-tomentose beneath. Var. **pendula**, branches drooping. Var. **pyramidalis** (*P. Bolleana*) is of columnar habit.

Andrewsii. Hybrid between *P. Sargentii* and *P. acuminata*, having oblong-ovate lvs. to 4 in. long.

angulata. Probably a hybrid, perhaps between *P. balsamifera* and *P. nigra*, having ovate lvs. to 7 in. long and 5 in. wide, truncate or heart-shaped at base, light green beneath. Var. **cordata** is a staminate hardier form.

angustifolia (*P. fortissima*). To 60 ft.: lvs. lanceolate or ovate-lanceolate, to 4 in. long, rounded or wedge-shaped at base, light green beneath. Sask. to Ariz.

aurea: *P. tremuloides* var.

Baileyana: *P. Jackii*.

balsamifera (var. *virginiana*. *P. monilifera*. *P. deltoidea* or *deltoides*). COTTONWOOD. To 90 ft., with broad head: lvs. ovate, to 7 in. long, truncate or somewhat heart-shaped at base, glossy above. Que. to Fla. and Tex.—The Norway poplar is probably a form of this species or a hybrid; it is a vigorous hardy tree planted in Minn. and Dak.—See *P. Tacamahacca*.

berolinensis. Hybrid between *P. laurifolia* and *P. nigra* var. *italica*, of columnar habit, with ovate long-pointed lvs. to 4 in. long, having a narrow translucent border.

betulifolia: *P. nigra* var.

Bolleana: *P. alba* var. *pyramidalis*.

canadensis. CAROLINA P. Hybrid probably between *P. nigra* and *P. balsamifera*, staminate plants only, with triangular-ovate lvs. to 4 in. long, truncate at base, somewhat ciliate on margins. Var. **aurea** has yellow lvs. Var. **erecta** is of pyramidal form. Var. **Eugenei** (*P. Eugenei*), EUGENE P., is of narrow-pyramidal habit. Var. **marilandica** (*P. marilandica*) has wide-spreading branches. Var. **regenerata** (*P. regenerata*) comes into lf. about two weeks earlier than var. **serotina** (*P. serotina*) which has wide-spreading ascending branches.

candicans. BALM-OF-GILEAD. To 90 ft., pistillate plants only: lvs. triangular-ovate, to 6½ in. long and 4 in. wide, heart-shaped at base, whitish and pubescent beneath. Probably a hybrid of European origin.—Sometimes confused with *P. Tacamahacca* var. *Michauxii*.

canescens. GRAY P. Resembling *P. alba* but with smaller lvs. only obscurely lobed and gray beneath. Eu., W. Asia.

carolinensis, caroliniana. This name in the trade may be applied to more than one poplar, but it probably refers to *P. canadensis*, mostly to var. *Eugenei*.

certinensis. Considered to be staminate plants of *P. berolinensis*, but material in the trade under this name may belong elsewhere.

cordata: probably *P. angulata* var.

deltoidea, deltoides: *P. balsamifera*.

elegans: *P. nigra* var. *plantierensis*.

Eugenei: *P. canadensis* var.

fastigiata: *P. nigra* var. *italica*.

fortissima: *P. angustifolia*.

Fremontii. To 90 ft.: lvs. triangular, to 2½ in. long and 3 in. wide, truncate or slightly heart-shaped at base, glossy above. Calif. to Ariz.

generosa. Hybrid between *P. trichocarpa* and *P. angulata* with lvs. pale green beneath and with translucent narrow margins.

græca: *P. tremuloides*.

grandidentata. LARGE-TOOTHED A. To 60 ft.: lvs. ovate, to 4 in. long, coarsely toothed, truncate or wedge-shaped at base, grayish-tomentose beneath but becoming glabrous. N. S. to N. C. and Tenn.—For the pendulous form see *P. pseudo-grandidentata*.

heterophylla. Swamp C. To 90 ft. or shrubby in cult.: lvs. broad-ovate, to 7 in. long, heart-shaped or rounded at base, pale green and often slightly pubescent below. Conn. to Ga. and La.

Jackii (*P. Baileyana*). Hybrid between *P. Tacamahacca* and *P. balsamifera*, with broad ovate lvs. heart-shaped at base.

koreana. To 75 ft.: lvs. to 6 in. long and 3¼ in. across, rounded at base, dark green and wrinkled above, whitish beneath, with red midrib. Korea.

lasiocarpa. To 60 ft.: lvs. ovate, to 1 ft. long, heart-shaped at base, light green and pubescent beneath, with red midrib. China.

laurifolia. To 45 ft.: lvs. elliptic-ovate to lanceolate, to 5 in. long, rounded at base, whitish and slightly pubescent beneath. Siberia. Var. **Lindleyana** (*P. Lindleyana*, *P. salicifolia*) has narrower lvs. with wavy margins.

Lindleyana: *P. laurifolia* var.

MacDougalii. To 100 ft.: lvs. broad-ovate, to 3 in. long, truncate at base. S. Calif., Ariz.

macrophylla: hort. name, sometimes referable to *P. candicans*, sometimes to *P. angulata*.

marilandica: *P. canadensis* var.

Maximowiczii. To 90 ft.: lvs. leathery, elliptic to nearly orbicular, to 5 in. long, slightly heart-shaped at base, whitish beneath and pubescent on veins. N. E. Asia, Japan.

monilifera: *P. balsamifera*.

nigra. Black P. To 90 ft.: lvs. triangular, to 4 in. long and 3 in. wide, wedge-shaped or rounded at base, light green beneath. Eu., Asia. Var. **betulifolia** has lvs. pubescent when young. Var. **italica** (var. *pyramidalis*. *P. fastigiata*). Lombardy P. Narrow-columnar habit and usually only staminate trees. Var. **plantierensis** (var. *elegans*), columnar form with pubescent petioles and branchlets. Var. **thevestina** has whitish trunk and grayish branches.

Nolestii: hort. name; probably a hybrid.

pekinensis: *P. tomentosa*.

Petrowskyana. Hybrid between *P. balsamifera* and probably *P. laurifolia*, with ovate lvs. to 6 in. long, pale beneath.

pseudo-grandidentata (*P. grandidentata* var. *pendula*). Probably a hybrid, having pendulous branches and lvs. similar to *P. tremula*.

Purdomii. Lvs. ovate or oblong-ovate, to 10 in. long, rounded or slightly cordate at base. China.

pyramidalis: hort. name for a narrow-headed or fastigate poplar, oftenest applied to *P. nigra* var. *italica*.

Rasumowskyana. Hybrid between *P. nigra* and probably *P. laurifolia*, with elliptic to orbicular lvs. to 6 in. long.

regenerata: *P. canadensis* var.

robusta. Hybrid between *P. angulata* and *P. nigra* var. *plantierensis*, of vigorous growth.

rotundifolia. Lvs. orbicular, to 4 in. across, often heart-shaped at base. Himalayas. Var. **Duclouxiana** has fruiting catkins to 6 in. long.

salicifolia: *P. laurifolia* var. *Lindleyana*.

Sargentii. Resembling *P. balsamifera* but with light yellow branchlets, pubescent buds, and mostly smaller lvs. Sask. to New Mex. and Tex.

serotina: *P. canadensis* var.

Sieboldii. Japanese A. To 60 ft.: lvs. ovate, to 3 in. long, rounded or wedge-shaped at base, pubescent when young. Japan.

Simonii. To 35 ft.: lvs. rhombic-ovate, to 5 in. long and 3 in. wide, rounded at base, whitish or pale green beneath. China. Var. **fastigiata** is of narrow pyramidal habit. Var. **pendula** has drooping branches.

suaveolens. To 90 ft.: lvs. ovate to ovate-lanceolate, to 4 in. long and 2¼ in. wide, rounded or wedge-shaped at base, glossy above and whitish beneath. Asia.—Likely to be confused with *P. Maximowiczii*.

szechuanica. To 120 ft.: lvs. ovate-oblong, to 8 in. long and 5 in. wide, rounded or wedge-shaped at base, whitish beneath. China.

Tacamahacca. Tacamahac. Balsam P. To 90 ft.: lvs. rather thick, ovate to ovate-lanceolate, to 5 in. long, rounded at base, whitish beneath. N. N. Amer. Var. **Michauxii** has lvs. pubescent on the veins beneath.—This species was formerly known as *P. balsamifera* but is not the plant that Linnæus described under that name.

tomentosa (*P. pekinensis*). Chinese White P. To 90 ft.: lvs. triangular-ovate, to 6 in. long, acuminate, truncate or slightly cordate at base, gray-tomentose beneath. China.

tremula. European A. To 90 ft., with open head: lvs. thin, orbicular to oval, to 3 in. long, truncate at base, with large teeth, becoming glabrous beneath, with flattened petioles. Eu., Asia, N. Afr. Var. **Davidiana** has lvs. with shallower teeth. Var. **pendula** has drooping branches. Var. **villosa** has silky-pubescent lvs. when young.

tremuloides (*P. græca*). Quaking A. To 90 ft.: lvs. ovate to orbicular, to 3 in. long, truncate at base, finely toothed, with flattened petioles. N. Amer. Var. **aurea** (*P. aurea*) has broader lvs. changing to orange-yellow in autumn. Var. **pendula** ("Parasol de St. Julien") has drooping branches.

trichocarpa. Western Balsam P. To 180 ft.: lvs. broad-ovate, to 5 in. or sometimes 10 in. long, truncate or rounded at base, whitish or rusty beneath. Alaska to S. Calif.

tristis. Small tree: lvs. narrow-ovate, 4 in. long and 2 in. wide, rounded at base, whitish and pubescent beneath. Cent. Asia.

Wilsonii. To 75 ft., pyramidal: lvs. ovate, to 7 in. long and 6 in. wide, heart-shaped or rounded at base, reddish-tomentose beneath but becoming glabrous. China.

Wislizenii. To 90 ft.: lvs. triangular-ovate, to 4 in. long and as broad, truncate at base, yellowish-green. W. Tex., New Mex.

Wobstii. Hybrid between *P. laurifolia* and probably *P. tristis*, with lanceolate lvs.

yunnanensis. Lvs. elliptic-ovate, to 6 in. long, wedge-shaped at base, whitish beneath, with red midrib. China.

PORANA. *Convolvulaceæ.* Trop. twining herbs with alternate cordate-ovate entire lvs. and small white, blue or purple fls. in cymes or panicles; sometimes grown in S. U. S.

paniculata. To 30 ft.: lvs. to 6 in. long, white-pubescent beneath: fls. white, to ⅓ in. across, in many-fld. panicles. India.—A profuse bloomer. Sometimes known as "White Corallita," but not related to Antigonon.

PORTERANTHUS: *Gillenia*.

PORTHIÆA ARGUTA: *Photinia villosa* var. *lævis*.

PORTIA-TREE: *Thespesia populnea*.

PORTLANDIA. *Rubiaceæ.* Shrubs or small trees from Mex. and W. Indies, with opposite leathery lvs., large white or purple fls. having campanulate or funnelform 5-lobed corolla, and fr. a leathery caps.; one species is grown in the American tropics. Propagated by cuttings.

platantha. Shrub to 3 ft., evergreen: lvs. oval: fls. white, showy, 3 in. or more across and 6 in. long; resembles somewhat a Solandra.

PORTULACA. Purslane. *Portulacaceæ.* Fleshy herbs with mostly alternate lvs., sun-blooming fls. of many colors subtended by a leafy involucre, and capsular frs. opening by the top falling off like a lid; grown as annuals in the flower-garden and one sometimes as a pot-herb. The common "pussley" (*P. oleracea*) is a persistent prostrate weed.

grandiflora. Rose-Moss. Prostrate or to 1 ft. high: lvs. terete, to 1 in. long: fls. rose, red, yellow, white, often striped, 1 in. or more across. Brazil.—A favorite garden ann. for warm sunny places.

marginata. Sts. thick and red: lvs. spatulate, ¾ in. long, margined with red: fls. yellow. Venezuela.

oleracea var. **sativa.** KITCHEN-GARDEN P. To 1½ ft., the sts. thick and soft and mostly erect: lvs. obovate, to 1½ in. long: fls. bright yellow, ½ in. across. Probably cultigen. Var. **giganthes** is a prostrate form with double fls. 1 in. across, grown for ornament.

pilosa. St. with tufts of white shaggy hairs: lvs. terete, ½ in. long: fls. red, ½ in. or less across. N. C. to Fla. and Mex. Var. **hortualis,** SHAGGY GARDEN P., has larger red-purple fls. to ¾ in. across. Cultigen.

PORTULACACEÆ. PURSLANE FAMILY. About 20 genera of widely distributed rather fleshy herbs or subshrubs with simple entire often terete lvs. and bisexual fls. having usually 2 sepals, 4–5 fugacious petals, few or many stamens, superior 1-celled ovary and capsular fr. A few are grown for ornament and pot-herbs, as Anacampseros, Calandrinia, Claytonia, Lewisia, Montia, Portulaca, Portulacaria, Spraguea, Talinum.

PORTULACARIA. *Portulacaceæ.* Two S. African succulent shrubs or small trees, of which one is grown in Calif. and under glass in the N.; also recommended for fodder in warm dry regions.

afra. To 12 ft., with soft wood: lvs. opposite, obovate, to ½ in. long, fleshy: fls. pink, about 1/12 in. long, in clusters.

POSOQUERIA. *Rubiaceæ.* Trop. American shrubs or small trees with opposite entire leathery lvs., fragrant white to red fls. in terminal corymbs having very long slender tube and 5-lobed limb, and fr. a fleshy berry; one species grown in S. Fla. Propagated by cuttings.

latifolia (*Oxyanthus isthmia*). Tree to 20 ft.: lvs. oval to oblong, to 10 in. long: fls. white, salverform, to 6 in. long: fr. yellow, globose, 2 in. across. Mex. to S. Amer.

POSSUM-HAW: *Ilex decidua.*

POTATO (*Solanum tuberosum*) is allied to the eggplant, the berry or seed-ball of the potato being the equivalent of the great fruit or berry of the other; also a close relative of the tomato, as is evidenced by the fact that one may be grafted on the other: see *Potomato.*

The home-garden practice of potato-growing is the same as in former years, unless modified by the necessity to fortify against insects and diseases, but the field culture has become to many persons a highly developed speciality with large areas under crop and the application of machinery to all parts of the work. The specialty potato-growing is of two kinds,—the market-gardening or truck-gardening kind in which the main effort is to make a product for the early market, and the general farm kind that aims to supply the long-season and over-winter demand. In both these specialty phases the grower must be well informed on the market prospects, as to the likelihood of over-supply. The business is represented by potato-grower's societies, in which the commercial outlook is constantly in view as well as the new developments in investigations that modify practices. The raising of certified seed is now an important output. Government maintains important services for the potato-grower. The literature is important and increasing, and the grower should be abreast of it.

The land for potatoes should be rather loamy, and ought to have a liberal supply of potash, either naturally or supplied in the drill. Large areas of muck land are now devoted to the crop, and the experienced grower will produce as good quality in such areas as on regular hard farm land. For the home garden, however, there is little opportunity in choice of soils. The land should be deeply plowed or spaded. Plant the potatoes 3 or 4 inches below the natural surface of the ground. It is ordinarily best to drop the pieces in drills. A continuous drill may be made by dropping one piece every 6 inches, but it is usually best to drop two pieces about every 12 to 18 inches. The drills are far enough apart to allow good tillage. If horse cultivation is employed, the drills should be at least 3 feet apart. The common practice of growing potatoes in ridges or elevated hills is inadvisable, unless the land is so wet that this practice is necessary to insure proper drainage (but in this case the land is not adapted to the growing of potatoes), or perhaps for the very early crop inasmuch as the ridges dry out and warm up quickly. At the last tilling the potatoes may be hilled up slightly in order to cover the tubers; but the hills need not be made in the beginning if the land is deeply prepared.

New kinds of potatoes are raised from the seed-ball, but the chance of obtaining something better than the existing kinds is remote. Usually good balls are not freely produced in commercial plantations. The seed is saved in the same way as tomato seed and sown in spring preferably in boxes or pans and the plantlets transplanted. Small tubers are produced the first season; these tubers are dug and kept in cellar and planted the following spring, and this second season they produce full size tubers although the character of the variety may not demonstrate itself until the third season. Good sized tubers may be produced the first year if the seed is started under glass and the seedlings transplanted two or three times into quick fertile soil.

The potato crop is propagated by tuber cuttings. The tubers or potatoes should be well grown and mature, and free from disease. It is ordinarily best to cut the potatoes to two or three eyes, leaving as much tuber as possible with each piece. Seven to eight bushels of potatoes are required to plant an acre. Small potatoes are considered not to be as good as large ones for planting. One reason is because too many sprouts arise from each one, and these sprouts are likely to crowd each other. The same is true of the tip end or seed end of the tuber. Even when it is cut off, the eyes are so numerous that one secures many weak shoots rather than two or three strong ones. For a very early crop in the garden, tubers are sometimes sprouted in the cellar. When the sprouts are 4 to 6 inches high the tubers are carefully planted. It is essential that the sprouts are not broken in the handling. In this practice, also, the tubers are first cut into large pieces, so that they will not dry out too much.

The potato is subject to blights, to the potato-bug or beetle, to aphis, and other diseases and pests. Most of them are controlled by thorough spraying or dusting four or five times with bordeaux to which arsenate of lead and nicotine sulfate are added. Scab, which is worst on alkaline lands, is destroyed by disinfecting seed potatoes with proper dilutions of corrosive sublimate, cyanide of mercury, or formaldehyde; these are violent poisons that are to be employed only under recognized formulas and control.

POTATO, AIR: *Dioscorea bulbifera.*

POTENTILLA. Cinquefoil. *Rosaceæ.* Herbs or sometimes subshrubs of the north temp. and frigid zones, with compound lvs. and yellow, white or red fls. solitary or in terminal cymes.

Potentillas are grown mostly in the border or rock-garden, but some of them useful in the flower-garden; most of them are hardy North. Propagated by seeds and division.

adscharica. To 1½ ft.: lvs. palmately 3–5-parted, the lfts. toothed and ciliate: fls. yellow, in many-fld. loose clusters. Caucasus.

alba. To 10 in.: lvs. palmately 5-parted, white-silky beneath: fls. white, to 1 in. across, in 3's. Cent. Eu.

alchemilloides. To 1 ft.: lvs. palmately 3–7-parted, white-silky beneath: fls. white, to 1½ in. across, in clusters. Pyrenees.

alpestris. To 8 in.: lvs. palmately 5-parted into deeply toothed lobes, dull green: fls. yellow, sometimes with orange spot at base, to 1 in. across, in clusters. Eu.

alpina: doubtful name in the lists.

amahnoides: a listed name.

andicola. Tufted per. with many-fld. branches to 6 in. high, silky-pubescent: lvs. pinnately 3–5-parted into ovate toothed lfts.: fls. yellow. Colombia.

Anserina (*Argentina Anserina*). Silver-Weed. Tufted herb with radical pinnate lvs. silky at least underneath; lfts. oblong, serrate to lacerate: fls. yellow, solitary on long peduncles, to 1 in. across. Shores and banks across the continent and in Eurasia, spreading by long runners.

arborea: hort. name, probably *P. fruticosa.*

argentea. To 1½ ft.: lvs. palmately 5-parted into deeply lobed lfts., white-tomentose beneath: fls. sulfur-yellow, ½ in. across, in clusters. Eu., Asia, N. Amer. Var. **calabra** (*P. calabra*) has lvs. white on both sides. Italy.

arguta (*Drymocallis agrimonioides*). To 3 ft.: lvs. pinnate into 7–11 toothed lfts., hairy on both sides: fls. creamy-white, ½ in. across, in dense clusters. N. B. to Va. and Colo.

argyrophylla. To 1½ ft.: lvs. palmately 3-parted into coarsely toothed lfts. white-tomentose below: fls. yellow, 1 in. across, in clusters. Himalayas.—Variable, or else more than one species is involved in the forms, some of which run to red forms; see *P. atrosanguinea.*

atrosanguinea. Closely resembling the last, but with red or purple fls. Himalayas.

aurea (*P. chrysocraspeda*). To 1 ft.: lvs. palmately 5-parted into toothed lobes, with silvery hairs on margins and veins: fls. yellow, ½ in. across, in few-fld. clusters. Eu.

bicolor. Hybrid probably between *P. argyrophylla* and *P. atrosanguinea*, with orange and red fls.

bifurca (*P. imbricata*). To 8 in.: lvs. pinnate into 5–15 2–3-parted lfts.: fls. yellow, ½ in. across. Himalayas.

Buccoana. To 2 ft.: lvs. 3-parted, coarsely toothed: fls. yellow, about ½ in. across, in many-fld. clusters. W. Asia.

calabra: *P. argentea* var.

canadensis. Sts. prostrate, to 2 ft. or more long: lvs. palmately 5-parted into toothed lfts.: fls. yellow, ½ in. across, solitary. N. B. to Ga. and Tex.

chrysantha. To 2 ft.: lvs. palmately 5–9-parted into toothed hairy lfts.: fls. golden-yellow, to 1 in. across, in few-fld. clusters. S. Eu.

chrysocraspeda: *P. aurea.*

cinerea. Tufted, to 4 in.: lvs. palmately 5-parted into oblong or obovate toothed lfts., thick and hairy: fls. pale yellow. Alps.

crinita. To 1 ft.: lvs. pinnate, with 11–15 toothed silky-pubescent lfts.: fls. yellow, about ½ in. across, in many-fld. clusters. Colo. to New Mex.

Cryptotæniæ. Erect: lvs. 3-parted, the lfts. toothed: fls. yellow, in panicled clusters. Japan.

Detommasii. Sts. ascending: lvs. palmately 5–7-parted into toothed lfts. silky-pubescent beneath: fls. yellow, 1 in. across, in clusters. S. Eu.

dissecta. Erect, branching, glabrous: lvs. palmately 5-parted into pinnatifid lfts.: fls. in clusters. Hudson Bay.

Dombeyi. Sts. decumbent, to 1 ft.: lvs. pinnate, with 3–5 lfts. toothed at tips: fls. yellow. Chile.

effusa. To 1½ ft., much branched: lvs. pinnate, with 5–11 toothed tomentose lfts.: fls. yellow, about ¼ in. across, in loose clusters. Sask. to New Mex.

engadinensis: hybrid.

erecta: *P. recta.*

formosa: *P. nepalensis.*

fragiformis. To 8 in.: lvs. 3-parted into broad coarsely toothed hairy lfts.: fls. yellow, to ¾ in. across, in few-fld. clusters. Siberia, Aleutian Isls.

Friedrichsenii: *P. frutisoca* var.

frigida. To 3 in., sts. often decumbent: lvs. 3-parted, hairy: fls. yellow. Alps.

frutescens: a name of uncertain botanical standing; probably *P. fruticosa.*

fruticosa (*Dasiphora fruticosa*). Shrub to 4 ft.: lvs. pinnate, with 3–7 silky-pubescent lfts. to 1 in. long, margins revolute: fls. bright yellow, to 1¼ in. across, in few-fld. clusters. North temp. zone. There are many vars. as: **albicans,** lfts. white-tomentose beneath, China; **dahurica,** to 1½ ft., lfts. ½ in. long, fls. creamy, China, Siberia; **Friedrichsenii,** hybrid between the type and var. *dahurica;* **ochroleuca,** fls. creamy-white; **parvifolia,** lfts. ¼ in. long, Asia; **Purdomii,** lfts. ⅓ in. long, nearly glabrous beneath, fls. pale yellow, China; **tenuifolia,** lfts. nearly linear; **Veitchii,** lfts. glaucous beneath, fls. creamy-white, China; **Vilmoriniana,** lfts. white-tomentose beneath, fls. creamy, China.

fulgens. To 2 ft.: lvs. pinnate, with many toothed lfts. silvery-pubescent beneath: fls. yellow, about ½ in. across, in panicled clusters. Himalayas.

gelida. To 2 ft.: lvs. 3-parted, the lfts. to ¾ in. long and coarsely toothed: fls. yellow, to 1 in. across, in 1–4-fld. clusters. N. Asia.

glandulosa (*Drymocallis glandulosa*). To 2 ft., sticky: lvs. pinnate into 7–9 toothed lfts.: fls. yellow, ½ in. across, in many-fld. clusters. S. D. to Calif.

gracilis. To 2½ ft.: lvs. palmately 5–7-parted, the lfts. white-tomentose beneath and cut halfway to mid-rib: fls. yellow, to ¾ in. across, in clusters. B. C. to Ore. and Mont. Var. rigida is listed.

grammopetala. To 1 ft.: lvs. 3-parted, the lfts. toothed, silky-pubescent beneath: fls. yellowish-white, in 3–7-fld. clusters. S. Eu.

grandiflora. To 15 in.: lvs. 3-parted, the lfts. toothed, hairy, to 1 in. long: fls. golden-yellow, to 1 in. across, in clusters. Eu.

heptaphylla (*P. thuringiaca*). To 1 ft.: lvs. palmately 5–7-parted, the lfts. toothed, green and hairy: fls. yellow. Eu.

Hippiana. To 2 ft.: lvs. pinnate, with 7–11 deeply toothed, silvery-pubescent lfts.: fls. bright yellow, to 1 in. across, in loose clusters. Sask. to New Mex.

hirta. To 1 ft., sts. often decumbent: lvs. palmately 5–7-parted, the lfts. hairy and deeply toothed: fls. bright yellow, ½ in. or more across, in few-fld. clusters. Eu.

Hookeriana. To 8 in.: lvs. mostly 3-parted into cut lfts., silky-pubescent on both sides: fls. ⅓ in. across, in dense cymes. Sask. to Mont.

Hopwoodiana. Hybrid between *P. nepalensis* and *P. recta:* fls. dark red at base, pale yellow in center, rose at tips.

hybrida. A group of hybrids between *P. nepalensis* and *P. argyrophylla,* with purple fls.

imbricata: *P. bifurca.*

kurdica. To 3 ft.: lvs. palmately 5-parted, the lfts. coarsely toothed, pubescent: fls. yellow. S. W. Asia.

Levieri. To 1 ft.: lvs. palmately 3–5-parted, the lfts. deeply toothed, silky-pubescent, ciliate: fls. yellow, about ¼ in. across, in loose clusters. Caucasus.

libanotica. Low, glandular-hairy: lvs. 3-parted, the lfts. coarsely toothed: fls. white, in clusters. Lebanon, on limestone cliffs.

Macnabiana. Hybrid between *P. argyrophylla* and *P. atrosanguinea.*

Meyeri. Similar to *P. argentea* but with shorter less divided lfts. Asia Minor.

montenegrina. To 1½ ft.: lvs. 3-parted, the lfts. toothed and slightly hairy: fls. golden-yellow, large. S. E. Eu.

multifida (*P. Tonguei*). To 4 in.: lvs. pinnate, the lfts. deeply cut into linear segms., white-hairy beneath: fls. yellow, small, in 2–3-fld. clusters. Eu.

nepalensis (*P. formosa*). To 2 ft. and more: lvs. palmately 5-parted, the lfts. toothed, green and hairy: fls. rose-red, 1 in. across, in forking panicles. Himalayas. Var. **Willmottiæ** ("Miss Willmott") is a dwarf free-flowering form or derivative with magenta-rose fls.

nevadensis. Sts. prostrate: lvs. palmately 3–5-parted, the lfts. coarsely toothed, silky-pubescent beneath: fls. yellow, in 3–4-fld. clusters. Spain.

nitida. Forming mats 1 in. or more high, the whole plant silky-hairy: lvs. 3-parted, the lfts, entire or toothed at tip: fls. rose, rarely white, to 1 in. across, solitary. High Alps.

nivalis. To 1½ ft.: lvs. palmately 5–7-parted, the lfts. toothed at apex or entire, silky-hairy on both sides: fls. white, in many-fld. clusters. S. Eu.

norvegica. To 1½ ft., ann. or bien.: lvs. 3-parted into oblong toothed lobes, rough-hairy: fls. yellow, in clusters. Eu.

O'Briana: listed name.

olympica: listed name.

palustris (*Comarum palustre*). MARSH C. Decumbent: lvs. palmately 5–7-parted into toothed lobes: fls. red or purple, to 1¼ in. across, in clusters or solitary. Swamps, N. Amer., N. Eu., N. Asia.

pennsylvanica. To 2½ ft.: lvs. pinnate into 5–15 deeply lobed lfts., gray-tomentose beneath: fls. yellow, in dense cymes. N. Amer.

perfecta. A reputed hybrid with maroon fls. shaded with yellow.

pimpinelloides. To 1 ft.: lvs. pinnate, with 15–25 deeply toothed lfts. and palmately parted stipules: fls. bright yellow, ½ in. across, in many-fld. clusters. S. E. Eu.

propinqua. To 1½ ft., often decumbent, silky-hairy: lvs. of 9–11 oblanceolate coarsely toothed lfts., white-tomentose beneath: fls. yellow. Alta. to Ariz.

pulcherrima. To 2 ft.: lvs. of 5–7 oblanceolate toothed lfts. white-tomentose beneath: fls. yellow. Alta. to New Mex.

pyrenaica. To 1 ft.: lvs. palmately 5-parted, the lfts. to ¾ in. long, toothed at apex: fls. golden-yellow, 1 in. across, in raceme-like clusters. Pyrenees.

recta (*P. erecta*). To 2½ ft.: lvs. palmately 5–7-parted, the lfts. toothed, green and hairy: fls. yellow, to 1 in. across, in many-fld. clusters. Eu.

reptans. Pubescent, with creeping shoots: lvs. digitate, with 5 obovate toothed lfts.: fls. yellow, to 1 in. or more diam., solitary from axils. Eu., Asia.

rivalis. To 2 ft.: lvs. pinnate, with 3–5 coarsely toothed lfts., green and pubescent: fls. yellow, ⅙ in. across, in loose clusters. B. C. to Mex.

rupestris. To 1½ ft., much branched, hairy: lvs. pinnate, with 5–7 toothed lfts.: fls. white, to 1 in. across, in loose clusters. Eu. Vars. **alba** and **pygmæa** are listed.

Russelliana. Hybrid between *P. nepalensis* and *P. atropurpurea:* fls. scarlet.

Sanguisorba. Erect: lvs. pinnate, the lfts. obovate, cut-toothed: fls. yellowish-white, usually in 2's. Siberia.

sanguisorbifolia: the European form of *P. pennsylvanica.*

Saxifraga. To 8 in.: lvs. palmately 5-parted into lanceolate leathery lfts. silvery-pubescent beneath: fls. white, in loose cymes. Alps.

sterilis. To 4 in., creeping: lvs. palmately 3-parted, the lfts. toothed, hairy above: fls. white. Eu.

supina. Procumbent ann., pubescent, pale green: lvs. pinnately 3–5-parted, the lfts. deeply toothed: fls. pale yellow. Eu., N. Afr., W. Asia.

Thurberi. To 2½ ft.: lvs. palmately 5–7-parted, the lfts. coarsely toothed: fls. reddish-purple, about ½ in. across, in loose clusters. New Mex. to N. Mex.

thuringiaca: *P. heptaphylla.*

Tonguei: *P. multifida.*

tridentata (*Sibbaldiopsis tridentata*). To 1 ft., woody at base: lvs. 3-parted, the lfts. 3-toothed at apex, shining above: fls. white, ¼ in. across, in loose clusters. Greenland to Ga. and Minn.

verna. Matted, sts. 6 in. or more long: lvs. palmately 5- or rarely 7-parted into obovate lfts. to 1½ in. long, toothed or cut: fls. golden-yellow, in few-fld. cymes. Eu., W. Asia. Var. **nana** is listed.

villosa. To 1 ft.: lvs. 3-parted, the lfts. coarsely toothed, silky above, white-tomentose beneath: fls. yellow, 1 in. across, in few-fld. clusters. Alaska to Wash., Siberia.

virgata. Erect, branched: lvs. palmately 7–9-parted, the lfts. pinnately cut, white-tomentose beneath: fls. yellow, small, in many-fld. clusters. Eu.

POTERIUM. *Rosaceæ.* One deciduous spiny erect subshrub native in S. Eu., sometimes planted in S. U. S. **P. spinosum** (*Sanguisorba spinosa*). To 1 ft., much branched: lvs. pinnate, of 7–15 pubescent lfts. ⅛ in. or less long: fls. unisexual, greenish, without petals, in spikes to 1 in. long: fr. red, globose, to ⅛ in. across.—For other plants listed as Poterium see *Sanguisorba.*

POTHOS. *Araceæ.* Climbing shrubs native in the tropics of the Old World, with entire or lobed lvs. and bisexual fls. borne on spadices. Cult. under glass or lath in our area, as for *Philodendron;* but the kinds commonly grown as Pothos are of other genera.

argyræus: *Scindapsus pictus* var. *argyrœus.*

aureus: *Scindapsus aureus.*

nitens. Hort. name of doubtful botanical standing: lvs. cordate-ovate, glossy purplish-green. Malaya.

POTOMATO. A name once applied to the combination potato-tomato plant produced by grafting one on the other. The grafting can be performed either way, but the hope that by this means one can produce good crops of both potatoes and tomatoes on the same plants is fanciful, although both tubers and tomatoes may be produced if the potato is the stock. See Cornell Bulletin 61, December 1893, as to name; and the literature of the subject is considerable.

POURRETIA: *Puya chilensis.*

PRATIA. *Lobeliaceæ.* Creeping or prostrate herbs suitable for the rock-garden or greenhouse: lvs. alternate, toothed: fls. 2-lipped, split to base at back, solitary in the axils: fr. a berry.

angulata. Per., sts. to 1 ft. long: lvs. to 1 in. long and ¾ in. across: fls. white streaked with purple ½ in. long: berry reddish-purple, ½ in. long. New Zeal.

PREMNA. *Verbenaceæ.* Trees or shrubs of the Old World tropics, with opposite lvs., small white or greenish fls. in pubescent corymbs or panicles, and fr. a small drupe; one species is grown out-of-doors in S. Fla.

odorata. To 25 ft.: lvs. broad-ovate, more or less cordate, to 8 in. long, tomentose beneath: fls. ⅙ in. long, in terminal corymbs 8 in. across: fr. dark purple. Philippines.

PRENANTHES. RATTLESNAKE ROOT. *Compositæ.* Per. herbs of the Old and New Worlds, having alternate lvs. and erect or drooping small heads of ligulate fls. borne in terminal spike-like panicles; pappus of white or brown bristles. By some authors the American species are retained under Nabalus and the Euro-African under Prenanthes. Adapted to borders and wild-gardens.

aspera (*Nabalus aspera*). To 4 ft., rough-hairy: lvs. to 3 in. long and 1 in. wide, toothed: heads light yellow, ¼ in. across, erect and short-peduncled; pappus straw-color. Ohio to Neb. and La.

purpurea. To 5 ft., glabrous: lvs. lanceolate, nearly entire, glaucous beneath: heads bluish-purple, on slender flexuose peduncles. S. Eu.

PRETTY FACE: *Brodiæa ixioides.*

PRIDE-OF-CALIFORNIA: *Lathyrus splendens.*

PRIDE-OF-INDIA: *Melia Azedarach.*

PRIM: *Ligustrum vulgare.*

PRIMROSE: *Primula.* Arabian-: *Arnebia cornuta.* Cape-: *Streptocarpus.* Evening-: *Œnothera.*

PRIMULA. PRIMROSE. *Primulaceæ.* Attractive mostly low per. herbs with basal lvs., fls. of many colors, in heads or umbels or in whorls one above another, corolla with slender tube and spreading lobes; mostly native to the north temp. zone, many kinds grown in gardens and greenhouses. Primulas have received much attention in recent years and are becoming fancier's plants.

The hardy primroses thrive in any good garden soil. Seed should be sown in spring or early summer in flats or pans and the seedlings transplanted. Large plants may be propagated by division. Seed of the greenhouse species (mostly *P. sinensis* and *P. malacoides*) should be sown in January if wanted for Christmas bloom, in soil composed of equal parts loam, leaf-mold and sand. Frequent transplantings should be given until September when the plants should be set in the pots in which they are to bloom. Shade and moisture should be provided during the summer. A good temperature for these primroses is 55–60° F. The hardy outdoor kinds are largely spring and early summer bloomers.

acaulis: *P. vulgaris.*

algida. To 8 in.: lvs. oblong, to 2 in. long: fls. violet, ⅓ in. across, in many-fld. heads in May–June. W. Asia.

Allionii. Lvs. ovate or oblong, to 1¾ in. long, gray-green and sticky: fls. rose with white eye, to ¾ in. across, in 1–7-fld. umbels on very short scapes, in spring. Maritime Alps.

angustifolia (*P. angustifolia* var. *Helenæ*). To 2 in.: lvs. linear-oblanceolate, to 2 in. long: fls. rose-pink, ½ in. across, usually solitary, in early summer. Colo.

anisodora. To 2 ft.: lvs. obovate, to 8 in. long: fls. dark purple, almost black, in superimposed whorls. China.

Auricula. AURICULA. To 8 in.: lvs. thick, persisting, obovate, to 4 in. long: fls. of many colors, about 1 in. across, in many-fld. umbels, in spring. Alps of Eu.—See *Auricula.*

Beesiana. To 2 ft.: lvs. oblong, narrowed to winged petiole: fls. rose-lilac with yellow eye, ¾ in. across, in superimposed whorls in early summer. China.

Briscoei. Hybrid between *P. Bulleyana* and *P. japonica.*

Bulleyana. To 2½ ft.: lvs. ovate-lanceolate, narrowed to winged petiole: fls. deep yellow, to 1 in. across, in superimposed whorls, in summer. China.

calycina: *P. glaucescens* var.

capitata. To 1½ ft.: lvs. oblong-lanceolate, to 5 in. long, narrowed to winged petiole, silvery beneath: fls. purplish-blue, ½ in. across, in dense heads. Himalayas.

cachemiriana, cashmiriana: *P. denticulata* var.

chinensis: *P. sinensis.*

chionantha. To 1½ ft.: lvs. lanceolate to oblong, to 10 in. long, narrowed to winged petiole, yellow-mealy beneath: fls. white, fragrant, to ¾ in. across, in superimposed umbels. China.

chrysopa. To 10 in.: lvs. oblong-elliptic, 1¼ in. long, on petioles to 5 in. long: fls. lilac with yellow eye, ½ in. across, lobes bifid, in 2–4-fld. umbels or sometimes 2 superimposed umbels. China.

chungensis. To 20 in. or more: lvs. oblong-oval, to 1 in. or more across, crenulate: fls. 4–8 in a terminal umbel and also in whorls, yellow (limb pink?), fragrant, about ½ in. long. China.

Clusiana. To 7 in.: lvs. ovate or oblong, to 3½ in. long, shining, with narrow cartilaginous margins: fls. rose or lilac, 1 in. or more across, the lobes bifid, in 1–6-fld. umbels. Alps.

Cockburniana. To 1½ ft.: lvs. obovate, to 4 in. long: fls. orange, 1 in. across, in 2 superimposed umbels. China.

conspersa. To 10 in.: lvs. oblong-lanceolate, to 2 in. long: fls. lilac with orange eye and yellow tube, to ¾ in. across, the lobes bifid, in superimposed umbels in summer. China.

cortusoides. To 1 ft.: lvs. ovate-oblong, heart-shaped at base, to 3½ in. long, lobed: fls. rose, to ¾ in. across, in many-fld. umbels in May and June. W. Siberia.

cottia. To 5 in.: lvs. obovate, to 3 in. long, sticky and covered with red glands: fls. rose with white eye, to 1¼ in. across, in 2–12-fld. umbels. Cottian Alps.

crispata. To 1 ft.: lvs. in rosettes, oblong, to 4 in. long, narrowed into winged petiole: fls. lilac or blue, about ½ in. across, in umbel-like heads. Himalayas.

decipiens: probably the correct name for the plant cult. as *P. magellanica.*

deflexa. To 2 ft.: lvs, in rosettes, oblanceolate, to 11 in. long, white-hairy: fls. dark blue or rose-purple, ½ in. long, in globose heads 1 in. across. W. China.

denticulata. To 10 in.: lvs. ovate-lanceolate, to 2 in. long, narrowed into winged petiole: fls. lilac, ½ in. across, in dense heads in early spring. Himalayas. Var. **alba** has white fls. Var. **cachemiriana** (*P. cashmiriana*) is more farinose, with rich purple fls. with yellow center.

deorum. To 10 in.: lvs. oblong or lanceolate, to 2 in. long, stiff, with cartilaginous margins: fls. purple, ½ in. across, in nodding one-sided 5–10-fld. umbels. Bulgaria.

effusa. To 1½ ft.: lvs. cordate-ovate, 1½ in. long, slightly lobed or toothed, on stalks to 5 in. long: fls. lavender-rose with yellow tube, ½ in. long, in superimposed umbels. W. China.

elatior. OXLIP. To 8 in.: lvs. wrinkled, ovate or oblong, to 3 in. long, pubescent beneath: fls. yellow, to 1 in. across, in many-fld. umbels in spring. Eu. to Persia.

erosa. To 7 in.: lvs. obovate, to 5 in. long, with jagged teeth: fls. purple or violet, ½ in. across, in many-fld. umbels. Himalayas.

farinosa. BIRDSEYE P. To 1 ft.: lvs. obovate-lanceolate, to 5 in. long, silvery or farinose beneath: fls. usually lilac-purple with yellow eye, ½ in. or more across, in many-fld. umbels in early summer.—Boreal or alpine regions in Old World.—The plants so named in N. Amer. belong to other species.

floribunda. BUTTERCUP P. To 8 in.: lvs. ovate, to 3 in. long: fls. yellow, ½ in. across, in many-fld. superimposed umbels, in winter and spring in a greenhouse. Himalayas. Var. **grandiflora** has fls. to 1 in. across.

florida. To 1 ft., white-mealy: lvs. oblong or ovate, to 3 in. long, subcordate at base: fls. blue-purple, about ¾ in. across, in 9-fld. umbels. China.

Florindæ. To 4 ft.: lvs. ovate-cordate, to 8 in. long, toothed, with reddish petiole 1 ft. long: fls.

sulfur-yellow, ½ in. across, drooping, in terminal 30–40-fld. mealy umbels, in summer. Tibet.

Forbesii. Baby P. To 14 in.: lvs. ovate, to 2 in. long, heart-shaped at base: fls. rose or lilac, to ½ in. across, in superimposed whorls, in winter and spring in the greenhouse. China, Burma.

Forrestii. To 3 ft., producing rootstocks several ft. long: lvs. ovate-elliptic, to 1½ in. long, wrinkled above, mealy beneath: fls. yellow with orange eye, fragrant, ¾ in. across, in many-fld. umbels. China.

frondosa. To 5 in.: lvs. oblong, 1 in. long, silvery beneath: fls. rosy-lilac, ½ in. across, in many-fld. umbels in spring. Balkans.

Giraldiana (*P. muscarioides*). To 1 ft.: lvs. narrow-oblong, narrowed into winged petiole: fls. blue, ¼ in. across, in heads. China.

glaucescens. To 5 in.: lvs. lanceolate, to 4 in. long, shining and glaucous, with broad cartilaginous margins: fls. rose to purple, 1 in. across, in 2–6-fld. umbels, May–June. Alps. Var. **calycina** (*P. calycina*) is more robust with larger fls.

glutinosa. To 4 in.: lvs. lanceolate, to 2½ in. long, glandular-sticky: fls. deep blue turning violet, to ¾ in. across, fragrant, in 1–6-fld. heads. Alps.

glycyosma. To 2½ ft.: lvs. ovate-lanceolate, to 1 ft. long, narrowed into winged petiole: fls. deep purple, ½ in. or less across, in 2–many-fld. superimposed umbels. China.

grandis. Tall herb: lvs. ovate, to 6 in. long, on petioles to 1 ft. long, wrinkled, pubescent below: fls. pale yellow, tubular, ½ in. long, on slender nodding pedicels 2 in. long, in many-fld. umbels. Caucasus.

Helenæ: *P. angustifolia.*

helodoxa. To 2 ft.: fls. deep yellow, in superimposed umbels in summer. China; requires protection.

hirsuta. To 4 in.: lvs. broad obovate, to 5 in. long, glandular-sticky: fls. rose, lilac or white, to 1 in. across, with slender pedicels, in 1–many-fld. umbels. Mts. of Eu.

hybrida: of the *japonica* type with very large purple fls.

integrifolia. To 2 in.: lvs. oval or oblong, to 1½ in. long, glandular, entire: fls. rose-lilac or rarely white, to 1 in. across, in 1–3-fld. umbels. Alps, Pyrenees.

involucrata. To 1 ft.: lvs. ovate or oblong, to 1 in. long, leathery, pale, on petioles 2 in. long: fls. white, fragrant, ¾ in. across, in 3–6-fld. umbels. Himalayas.

japonica. To 2 ft.: lvs. obovate-oblong, to 6 in. long, narrowed into winged petioles: fls. purple, rose or white, 1 in. or more across, in many-fld. superimposed umbels in summer. Japan. Color forms are **alba, atrosanguinea, rosea.**

Juliæ. Lvs. orbicular-cordate, with winged petiole: fls. rose or red, to 1 in. across. Caucasus.

kewensis. Hybrid between *P. floribunda* and *P. verticillata:* to 1½ ft.: lvs. obovate, to 8 in. long, narrowed into winged petiole: fls. bright yellow, fragrant, ¾ in. across, in superimposed umbels, in winter and spring in the greenhouse. Var. **farinosa** is covered with silvery-white powder.

lichiangensis. To 14 in.: lvs. ovate-oblong, lobed, heart-shaped at base: fls. rose to red with greenish eye, fragrant, in umbels. China.

Littoniana. To 2 ft.: lvs. broad-lanceolate, 8 in. long, hairy: fls. violet-blue, fragrant, ⅓ in. across, in dense spikes to 5 in. long. China.

longiflora. To 1 ft., mealy: lvs. oblong, to 3 in. long: fls. violet with yellow throat, ¾ in. across, the corolla-tube 1 in. and more long, in many-fld. umbels. Alps.

luteola. To 10 in.: lvs. lanceolate, to 8 in. long: fls. sulfur-yellow, ½ in. across, in many-fld. umbels in summer. Caucasus.

magellanica. Often treated as a var. of *P. farinosa,* but the plant intended is probably *P. decipiens:* to 8 in.: lvs. rhombic, mealy beneath: fls. pink or white, in heads. Chile.

malacoides. Fairy P. To 1½ ft.: lvs. ovate, to 3 in. long, heart-shaped at base, on petioles to 7 in. long: fls. lilac and rose, to ½ in. across, in many-fld. superimposed umbels, in winter and spring in the greenhouse. China. Var. **alba** has white fls. and var. **rosea** bright rose fls. Var. **Lelandi** has large fls. said to reach 1½ in. across. Var. **robusta** has large fls. in great profusion.

marginata. To 5 in., mealy: lvs. oblong, to 4 in. long, with silvery margins: fls. violet-rose, to 1 in. across, in 2–20-fld. umbels in spring. Alps.

microdonta. To 1 ft.: lvs. broad-ovate, to 5 in. long, long-petioled: fls. yellow, ½ in. across, in many-fld. umbels. China.

minima. Lvs. obovate, to 1 in. long, shining: fls. rose or white, to 1 in. across, the lobes bifid, 1–2 on very short scapes. Mts. of Eu.

Mooreana. Differs from *P. capitata* in larger lvs. which are coarsely reticulated and snow-white beneath and bright green above. China.

muscarioides: *P. Giraldiana.*

nivalis. To 10 in.: lvs. ovate- oblong to lanceolate, to 5 in. long: fls. purple or white, to ¾ in. across, in many-fld. umbels. Caucasus to China.

obconica. To 1 ft.: lvs. oblong-ovate, to 4 in. long, with irritating hairs: fls. lilac or pink, to 1 in. across, in many-fld. umbels, in winter in the greenhouse. China. Var. **grandiflora** has fls. to 1½ in. across. Var. **gigantea** is a large form. Var. **alba** has white fls.

oblanceolata. Lvs. oblanceolate, to 1 ft. long, glaucous: fls. rose, 1 in. or more across, in superimposed umbels. China.

officinalis: *P. veris.*

pannonica: *P. veris* var. *inflata.*

Parryi. To 1 ft.: lvs. obovate-oblong, to 8 in. long, narrowed to winged petiole: fls. purple with a yellow eye, 1 in. across, in many-fld. umbels in summer. Rocky Mts.

Paxiana. To 1½ ft.: lvs. heart-shaped, to 5 in. long and 7 in. broad, 7–12-lobed, on petioles 10 in. and more long: fls. blue-lilac, 1 in. across, in superimposed umbels. China.

Poissoni. To 5 ft.: lvs. narrowly oblong, to 5 in. long, stiff and glaucous: fls. rose, to 1¼ in. across, in superimposed umbels in summer. China.

polyantha. Polyanthus. A hybrid group, probably having parentage of *P. veris, P. elatior* and *P. vulgaris:* to 1 ft.: lvs. obovate, narrowed into winged petiole: fls. of many colors, in many-fld. umbels or sometimes solitary, in spring; an old garden plant.

pubescens. A group of hybrids between *P. Auricula* and *P. hirsuta:* fls. rosy-crimson with white center.

pulverulenta. To 3 ft.: lvs. obovate, to 16 in. long: fls. purple with orange-brown eye, 1 in. across, in superimposed umbels on a silvery scape, in summer. China.

rosea. To 8 in.: lvs. oblong, to 2½ in. long: fls. bright rose, ¾ in. across, in loose heads, in spring. Himalayas. Var. **grandiflora** has large fls.

rufa. To 8 in., hairy: lvs. elliptic, 2½ in. long, reddish-pubescent: fls. deep yellow, ½ in. across, in many-fld. umbels. China.

Rusbyi. To 10 in.: lvs. oblong-spatulate, denticulate, with margined petiole to 5 in. long: fls. deep purple with yellow eye, 6–10 to a scape. New Mex., Ariz.

saxatilis. To 10 in.: lvs. oblong, to 3 in. long, heart-shaped at base, lobed and crisped: fls. rose-lilac, to ¾ in. across, in 1–10-fld. umbels. N. Asia.

seclusa. To 1½ ft., hairy: lvs. cordate-ovate, to 10 in. long: fls. red, about ⅕ in. across, in superimposed umbels. China.

secundiflora. To 8 in. or more: lvs. oblong, to 3 in. long, narrowed into winged petiole, yellow-mealy beneath when young: fls. deep violet, ¾ in. across, in 6–10-fld. one-sided umbels. China.

sibirica. To 8 in.: lvs. ovate, to ¾ in. long, pale green: fls. lilac or rose, to ½ in. across, in few-fld. loose umbels. Arctic Eu., Asia, N. Amer.

Sieboldi. To 8 in.: lvs. ovate-oblong, to 4 in. long, lobed, heart-shaped at base: fls. white, rose or purple, to 2 in. across, in many-fld. umbels in spring. Japan. Var. **grandiflora** is a garden form.

sikkimensis. To 2 ft.: lvs. oblong, to 5 in. long, wrinkled, sharp-toothed: fls. yellow, 1 in. across, in many-fld. umbels in late spring. Himalayas.

sinensis (*P. chinensis*). Chinese P. To 8 in.: lvs. round, to 4 in. long, lobed, often heart-shaped at base, long-petioled: fls. in many colors, to 1½ in. across, in many-fld. umbels, blooming in winter in the greenhouse. China. Var. **filicifolia** has crisped lvs. Var. **fimbriata** has fringed or crested fls. Var. **stellata,**

Star P., has fls. in superimposed umbels.—Popular florist plant in many forms.

spectabilis. To 4 in.: lvs. oblong, to 4 in. long, stiff and glossy: fls. rosy-purple, 1 in. across, in 1–7-fld. umbels in summer. Alps.

sphærocephala. To 1 ft.: lvs. oblanceolate, to 5 in. long, narrowed into winged petiole: fls. purple, in small globular heads. China.

stellata: *P. sinensis* var.

suffrutescens. To 4 in.: lvs. thick, spatulate, toothed at apex: fls. red-purple, ½ in. across, several to a scape. Calif.

Veitchii. To 1 ft.: lvs. round, to 4 in. long, silvery beneath, long-petioled: fls. rose, in a many-fld. umbel or umbels superimposed. China.

veris (*P. officinalis*). Cowslip. To 8 in.: lvs. ovate or ovate-oblong, to 3 in. long, pubescent beneath: fls. yellow, fragrant, to 1 in. across, in many-fld. umbels in spring. Eu. Var. **inflata** (*P. pannonica*) has calyx as long as corolla-tube. Var. **suaveolens** has lvs. densely white-tomentose beneath, and slightly fragrant fls.

verticillata. To 2 ft.: lvs. lanceolate, to 8 in. long, narrowed into winged petiole: fls. yellow, fragrant, to ¾ in. across, in superimposed umbels, in winter in the greenhouse. S. Arabia.

viscosa. To 8 in.: lvs. oval to lanceolate, to 7 in. long, rank-smelling, yellowish-green, glandular: fls. rose-lilac, fragrant, ½ in. across, in many-fld. umbels in late spring. Alps and Pyrenees.

vittata. To 10 in.: lvs. narrow-oblong, to 6 in. long: fls. purple, ½ in. across, in many-fld. umbels or 2 superimposed umbels. China.

vulgaris (*P. acaulis*). To 6 in.: lvs. oblong, to 3 in. long, wrinkled: fls. yellow, purple or blue, 1½ in. across, solitary on long sts., in spring. Eu.

Wardii. To 10 in., tufted: lvs. oblong, to 1½ in. long, narrowed into winged petiole: fls. rose or violet, in few-fld. umbels. China.

Wilsonii. To 2 ft.: lvs. oblanceolate, to 8 in. long: fls. purple or violet, to ¾ in. across, in superimposed umbels. China.

Winteri. Plant white- or yellow-mealy: lvs. obovate, 4 in. long: fls. pale purple with yellow eye, 1¼ in. across, in many-fld. umbels. Himalayas.

PRIMULACEÆ. Primrose Family. Nearly 30 genera of herbs, or seldom suffruticose, widely distributed particularly in the northern hemisphere, furnishing many flower-garden and greenhouse plants. Family characterized by the bisexual regular fls. with 5 petals more or less united, 1-celled ovary with many seeds, 1 style, and dehiscent fr. The genera in cult. are: Anagallis, Androsace, Cortusa, Cyclamen, Dodecatheon, Douglasia, Glaux, Lysimachia, Primula, Samolus, Soldanella, Steironema, Trientalis.

PRINCES-FEATHER: *Amaranthus hybridus* var. *hypochondriacus, Polygonum orientale.*

PRINSEPIA. *Rosaceæ.* Asian deciduous spiny shrubs with simple lvs., yellow or white fls. in axillary clusters or racemes, and fr. a purple or black drupe; grown for ornament and hardy N.

Propagated by seeds sown as soon as ripe or stratified, by cuttings of young wood under glass, and by layers.

sinensis. To 6 ft.: lvs. ovate-lanceolate to lanceolate, to 3 in. long: fls. yellow, ½ in. across, Mar.–Apr.: fr. purple, ½ in. long. Manchuria.

uniflora. To 5 ft.: lvs. narrow-oblong, to 2½ in. long: fls. white, ½ in. across, Apr.–May: fr. black, bloomy, ½ in. long. China.

PRITCHARDIA (*Styloma*). *Palmaceæ.* Tall or middle-sized hermaphrodite unarmed fan-palms of the Pacific Isls.: lvs. heavy but pliant, cuneate-fan-shaped, strongly plicate: spadix among the lvs., short- or long-peduncled and the fls. in a more or less compact cluster at its end; fls. small, green, placed singly, elongated in bud; stamens 6: fr. globose or ellipsoid, small, 1-seeded. The Pritchardias are striking palms of regular form, prominent in the Hawaiian, Samoan, Fiji and other archipelagoes; some of them thrive in protected places in S. Fla. and a few in S. Calif. The species known in the continental U. S. fall into the small-fruited (*P. pacifica, P. Thurstonii*) and the large-fruited (*P. Gaudichaudii, P. Martii*) groups. See *Palm* for cult.

Gaudichaudii. To 20 ft. and trunk 1 ft. thick: lvs. 3–4 ft. long, on the young plant bearing brown matted wool underneath but nearly or quite nude with age; segms. about 60 and 1 ft. long; petioles 2–3 ft. long: fr. spherical, to 1¾ in. diam. Hawaiian Isls.

grandis: *Licuala grandis.*

Martii. To 12 ft., trunk stout: lvs. with appressed ciliate scales underneath: fr. ovoid-ellipsoid or somewhat obovoid, to 1¾ in. long and 1⅜ in. thick. Oahu.

pacifica. Trunk to 30 ft. and 1 ft. thick: lvs. to 4 ft. and more long, green both sides and with minute scales or with tubercles underneath; segms. about 90, extending about one-third the way down; petiole to 3 ft. or more: spadices shorter than lvs.: fr. globose, about ½ in. diam. Fiji.

Thurstonii. Slender: segms. thickish and stiff, glaucescent underneath and bearing elliptic scales; segms. about 70, reaching one-third to one-half the length of blade: spadices with much-elongated peduncles that hang below the lvs. and bear the compact cluster at the end: fr. about ¼ in. diam. Fiji.

Wrightii: *Colpothrinax Wrightii.*

PRIVET: *Ligustrum.*

PROBOSCIDEA. Unicorn-Plant. *Martyniaceæ.* Sticky-pubescent thick-stemmed ann. and per. herbs with large long-stalked lvs., large yellowish-purple fls. in few-fld. axillary racemes, and woody curved caps. having a beak which splits into 2 hook-like appendages; 9 known species, in the western hemisphere.

These plants are grown for ornament or for the young fruits which are pickled as cucumbers or used in mixed pickles. In the South seeds may be sown where the plants are to stand but in the North they may be sown in hotbeds and transplanted.

formosa: *P. Jussieui.*

fragrans. Ann., sts to 2 ft.: lvs. broad-ovate or deltoid, mostly broader than long, at maturity usually 5-lobed: fls. deep purplish. Mex.—The plant commonly grown under this name is *P. Jussieui.*

Jussieui (*P.* and *Martynia louisiana. M. Proboscidea.*) Common U. or Proboscis-Flower. Clammy, low and spreading, to 3 ft. broad, the branches in opposite pairs: lvs. nearly orbicular to ovate-cordate, to 1 ft. across, wavy-margined but not lobed: fls. creamy-white to violet or light red, to 2 in. long: fr. hanging, to 6 in. long, half the length being the slender beak. Del. and Ind. to New Mex.—Grown in the garden under such names as *Martynia craniolaria, formosa, fragrans.*

louisiana: *P. Jussieui.*

PROBOSCIS-FLOWER: *Proboscidea Jussieui.*

PROCUMBENT: trailing or lying flat, but not rooting.

PROLIFEROUS: bearing offshoots or redundant parts; producing other similar structures on itself, as when a head of calendula has secondary heads springing from it.

PROMENÆA. *Orchidaceæ.* Brazilian epiphytes with 2-lvd. pseudobulbs and 1–2-fld. pendulous infl., the sepals and petals similar, the lip 3-lobed; grown in a warm greenhouse. See *Orchids*.

citrina: *P. xanthina*.

xanthina (*P. citrina*). Lvs. to 2 in. long and ¼ in. wide: fls. citron-yellow, the side lobes of lip spotted with red, about 1½ in. across, July-Aug.

PROPAGATION of plants is accomplished by two different means: (1) by seeds and spores, which are normal reproductive bodies, the seeds and sometimes the spores the direct result of sexual processes; (2) by vegetative or asexual parts. The second category may be again divided into propagation (a) by division of the plant, (b) by separation of naturally detachable parts, as bulblets and offsets, (c) by layers, (d) by cuttings, (e) by graftage.

Although plants have been propagated from immemorial time and great skill has been developed in the practices, yet modifications of these experiences are constantly arising and physiological studies are likely to produce considerable change in method. Many of the old ideas on multiplication of plants are being challenged. Persons desiring to develop the greatest success in the work should keep in touch with investigations as they are published. The skilled propagator develops a kind of intuitive sense as to how a plant new to him may be increased and handled to best advantage. The propagation of plants, as a subject, is much more than habit and manual skill.

Seedage is the subject and the practice of propagating plants by means of seeds. The practice is not only interesting in itself as a development of skill but it brings the practitioner into close relationship with fascinating natural objects. There is peculiar satisfaction in being the agent that causes the release of the dormant energy in the seed and sets the processes into cumulative action until the plant has attained its term. Many persons do not wish to wait for the slow processes of seed propagation, in the perennial plants, and therefore purchase their stock ready raised; but thereby they miss one of the major rewards in gardening, for the plant is as interesting in its beginnings as in its endings.

Seeds of most plants should be kept dry and also rather cool. It is better to rely on fresh seeds. Test them by germinating in boxes in the house, if possible, before planting them in the open. Most tree seeds should be kept moist until planted. They are usually buried or kept in sand. This is true of pits and seeds in dense integuments and nuts and sometimes of those with thick impervious coats. The burying in earth is known as stratification when there are alternating layers of sand and seeds: the purpose is to prevent drying out and to soften the shell or integuments; in many cases the stratification is allowed to freeze. Seeds of bushes and trees stratified in late summer or autumn usually germinate the following spring, although haws and some others may remain until the second season. Some kinds of seeds are the better for soaking, especially such as for some reason have been delayed in sowing. Sweet pea seed is benefited by soaking if not put into the ground until the soil is warm. Seed of canna, moonflower and others with hard shells may be scraped until the outer shell is pierced or is very thin, to allow the entrance of water.

In sowing seeds, the general rule is to cover them twice or thrice their thickness. This rule applies to the greater number of kinds of seeds, but in many plants of a naturally short season of bloom or growth, examples of which are the garden pea and sweet pea, it may be advisable to sow the seed deeper. Also, in sowing very minute seeds, as tobacco, petunia, begonia, and others of like size, care should be taken to place them only under the surface of the soil,—simply pressed down with a smooth surface or allowed to settle into the soil with the soaking in of the water. The soil for all seeds should be loose and porous, to allow the excess moisture to escape and the warmth to penetrate, but should be firmed directly over the seeds to induce an upward flow of moisture. One of the most common mistakes is sowing all kinds at the same time without regard to the season, thus causing a failure with some, while others grow freely. Seeds of tender plants should be sown only when the ground has become thoroughly warm, while seeds of the so-called hardy plants may be sown as early in the spring as the ground is fit to work.

Very small seeds are sometimes mixed with sand or other inert material to allow of more uniform distribution; and the bed is frequently shaded under lath or cheese cloth until the seedlings are established.

If seeds are not sown where the plants are to stand, the seedlings must be transplanted before they begin to crowd or become "drawn." This operation the gardener calls in one instance "pricking out." This means taking the young plants from the seed-box as soon as they are large enough to be handled—usually when the first "rough" leaves have developed—and replanting them in other boxes or pots, either singly or at a greater distance apart than they were when in the seed-boxes. Transplant on a cloudy day, and just before a rain, if possible, if the plants are going in the open ground. Plants usually "take" quickly if transplanted on freshly plowed or spaded ground. Shade if necessary for a day or two, but do not cover closely. If the plants are of considerable size it is good practice to remove part of the leaf surface to reduce evaporation.

Division is the simple process of dividing plants that have rootstocks or tubers, or produce soboles or suckers, the parts being cut or broken into pieces, or of breaking up the clumps of plants that make large crowns or stools. Thus rhubarb and canna are multiplied by dividing the roots into pieces bearing an eye or bud; dahlia is increased by breaking apart the clustered tubers. Division is performed mostly in the dormant season, either after the plants have ripened in autumn or before the growth starts in spring.

Separation is a form of division. It takes the bulbels about the mother bulb, the bulblets in the axils of leaves and in the flower-cluster, the offsets in sedums, the plantlets on the leaves of bryophyllum and on the fronds of certain ferns, and sets them out to make new plants, as is their destiny. It would be remissness on the part of the gardener not to respond to the suggestions the plant offers him.

Layerage is the rooting of branches while still part of the parent; and a layer is an attached stem of some kind laid in the earth or other medium with the expectation that it will take root and can then be severed and become an independent plant. The vine-like plants can be propagated readily by means of layers; so can most soft-wooded plants, as willows, maples, currants. It is usual to put down the branches in autumn. In a year they should be ready to be severed from the parent. They may also be made in spring before growth starts. See that the layered part rests in moist earth. Usually roots arise more freely if the shoot is cracked or notched at the buried point. The layer may be held down by a forked stick ("pegged down"), or by a stone or clod. Take care that the shoot does not throw up suckers behind the layered part. Figs. 10 and 11 illustrate layers, in a diagrammatic way.

A special form of layerage, in which the part is not in the ground, is known as air-layering (or pot-layering) because the roots are struck in a pot or ball of moss (whence the term "mossing") secured to a branch or trunk that cannot be bent to the ground. A notch is usually made at the desired place, and earth held around it by splitting a pot and applying it to the limb. When sufficient roots have formed in the pot, the branch is severed beneath it, the top perhaps shortened-in, and the part treated as an independent plant. The atmosphere should be moist, if possible, where the operation is performed, particularly if the part is merely balled with moss and without a pot or other protection.

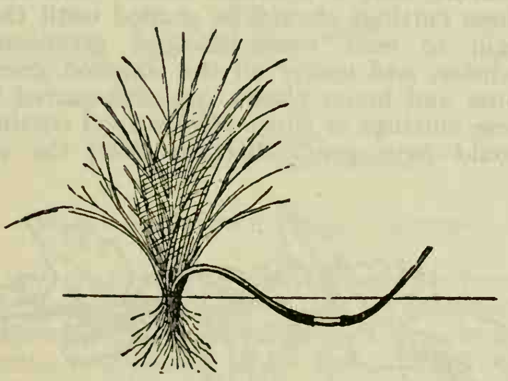


Fig. 10. A girdled layer.

Rubber plants, tall foliage subjects, and many others may be multiplied in this way; and sometimes when the trunk becomes too long or unshapely, the top may be rooted anew and then severed, the old stem and root discarded, and the corrected plant placed regularly in a pot or tub.

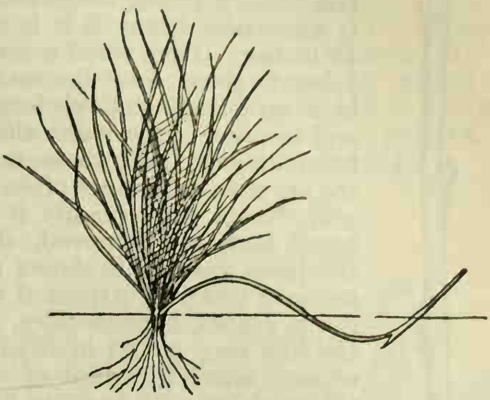


Fig. 11. A notched layer.

Cutting propagation differs from layerage in the fact that the part is severed before roots are formed. Cuttings, therefore, are parts of plants inserted in soil or water with the intention that they shall grow and make new plants. They are of various kinds. They may be classified, with reference to the age of the wood or tissue, into two classes: those made from perfectly hard or dormant wood (taken from the winter twigs of trees and bushes), and those from more or less immature or growing "wood." They may be classified again in respect to the part of the plant from which they are taken, as root-cuttings, tuber-cuttings (as the ordinary "seed" planted for potatoes), stem-cuttings and leaf-cuttings.

Dormant stem-cuttings are employed with grapes, currants, gooseberries, willows, poplars and many other kinds of soft-wooded trees and shrubs. Such cuttings are ordinarily taken in fall or winter, but cut into the proper lengths and then buried in sand or moss where they do not freeze, that the lower end may heal over or callus. In spring these cuttings are set in the ground, preferably in a rather sandy and well-drained place. Usually, hardwood cuttings are made with two to four joints or buds, and when they are planted only the upper bud projects above the ground. They may be planted

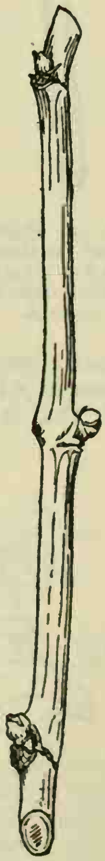


Fig. 12. Cutting of grape, made of the just-ripened cane.

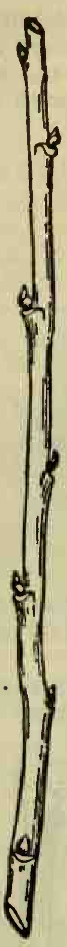


FIG. 13. Hardwood cutting, made from ripened cane of currant.

erect, or somewhat slanting. That the cutting may reach down to moist earth, it is desirable that it should not be less than 6 inches long; and it is sometimes better if it is 8 to 12 inches. If the wood is short-jointed, there may be several buds on a cutting of this length; and to prevent too many shoots from arising from these buds, the lowermost buds are often cut out. Roots start readily if the lower buds are removed, since the buds grow into shoots and not into roots. Cuttings of currants, grapes, honeysuckles, and the like may be set in rows far enough apart to admit of easy tillage either with horse or hand tools, and the cuttings may be placed 3 to 8 inches apart in the row. After the cuttings have grown for one season, the plants are usually transplanted and given more room for the second year's growth, after which they are ready to be set in permanent plantations. In some cases, the plants are set in the field at the end of the first year; but two-year plants are stronger and usually preferable. Dormant cuttings are shown in Figs. 12 and 13, ready for setting in spring.

Softwood or greenwood cuttings are rooted under cover, in a greenhouse, coldframe or a dwelling house. They are usually made of wood mature enough to break when it is bent sharply. When the wood is so soft that it will bend and not break, it is too immature, in most plants, for the making of good cuttings. One to two joints is the proper length of a greenwood cutting. If of two joints, the lower leaf should be cut off and the upper leaves cut in two, so that they do not present their entire surface to the air and thereby evaporate the plant juices too rapidly. If the cutting is of only one joint, the lower end is usually cut just above a joint. In either case, the cuttings are usually inserted in sand or well-washed gravel, nearly or quite up to the leaves. Keep the bed uniformly moist throughout its depth, but avoid any soil that holds so much moisture that it becomes muddy and sour. These cuttings should be shaded until they begin to emit roots. Coleus, geraniums, fuchsias, and nearly all the common greenhouse and house plants, are propagated by these cuttings or slips. Greenwood cuttings should have gentle bottom heat; the soil should be such that it will hold moisture and yet not remain wet; the air about the tops should not become close and stagnant, else the plants will damp off; and the tops should be shaded for a time. Figs. 14, 15, 16 show greenwood cuttings.

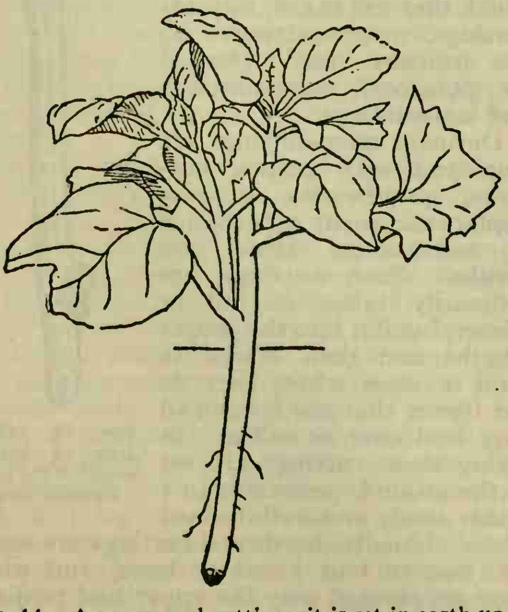


FIG. 14. A greenwood cutting; it is set in earth up to the horizontal line.

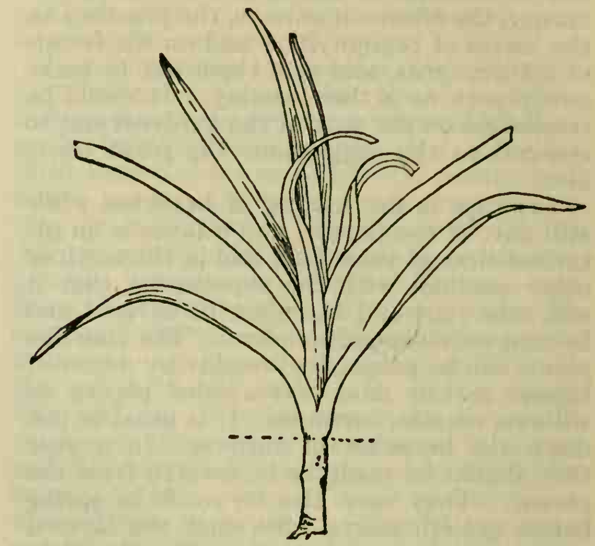


FIG. 15. Carnation cutting.

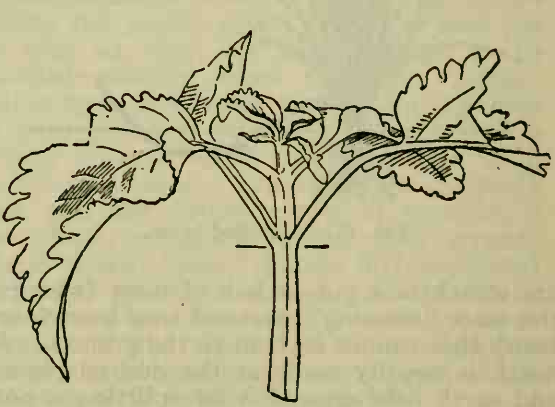


FIG. 16. Coleus cutting.

A stage between the hardwood dormant cutting and the softwood green cutting is represented in Figs. 17 and 18. Here the cutting is green and in leaf but it is woody. Ordinarily such cuttings are taken late in the season when growth is nearly mature. Three or more joints are comprised in the cutting, the leaf surface is somewhat reduced, and it is inserted in sand in a frame or propagating house in midsummer or later. Fig. 18 is a thuja or arbor-vitæ cutting made in autumn or winter; it is practically a true hardwood cutting, inasmuch as the leaves are persistent.

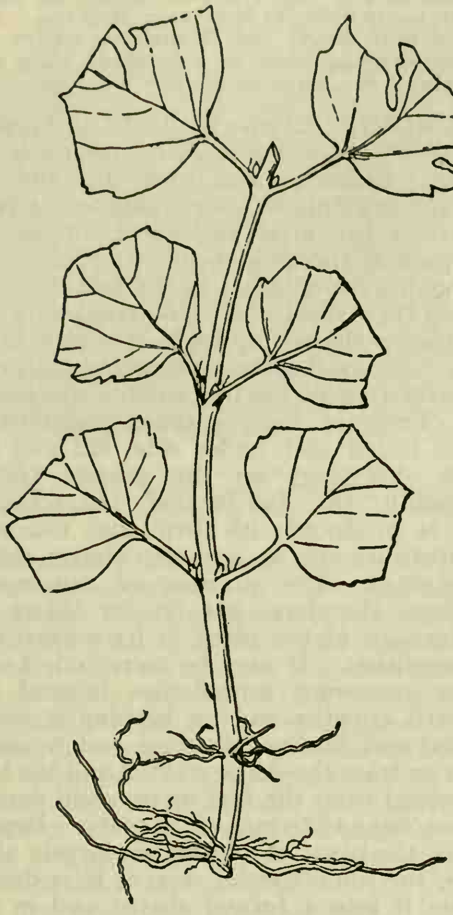


FIG. 17. Mature-wood cutting of viburnum.

Root-cuttings are employed for blackberries, raspberries, and a few other things. They are ordinarily made of roots from the size of a lead pencil to one's little finger, and are cut in lengths 3 to 5 inches long. The cuttings are stored the same as stem-cuttings and allowed to callus. In the spring they are planted in a horizontal or nearly horizontal position in moist sandy soil, being entirely covered to a depth of 1 or 2 inches.

Leaf-cuttings are often employed for the fancy-leaved begonias, gloxinias, and a few other plants. The young plant usually arises most readily from the leaf-stalk or petiole. The leaf, therefore, is inserted into the ground much as a green-cutting is. Begonia leaves, however, throw out young plants from the main veins when these veins or ribs are cut. Therefore, well-grown and firm begonia leaves are sometimes laid flat on the sand and the main veins cut; then the leaf is weighted down with pebbles or pegs so that these cut surfaces come into intimate contact with the soil beneath. The begonia leaf may be treated in various other ways.

Plants may be propagated by means of cuttings or cions that are inserted in another plant rather than in soil. The practice is discussed on page 282 under *Graftage.*

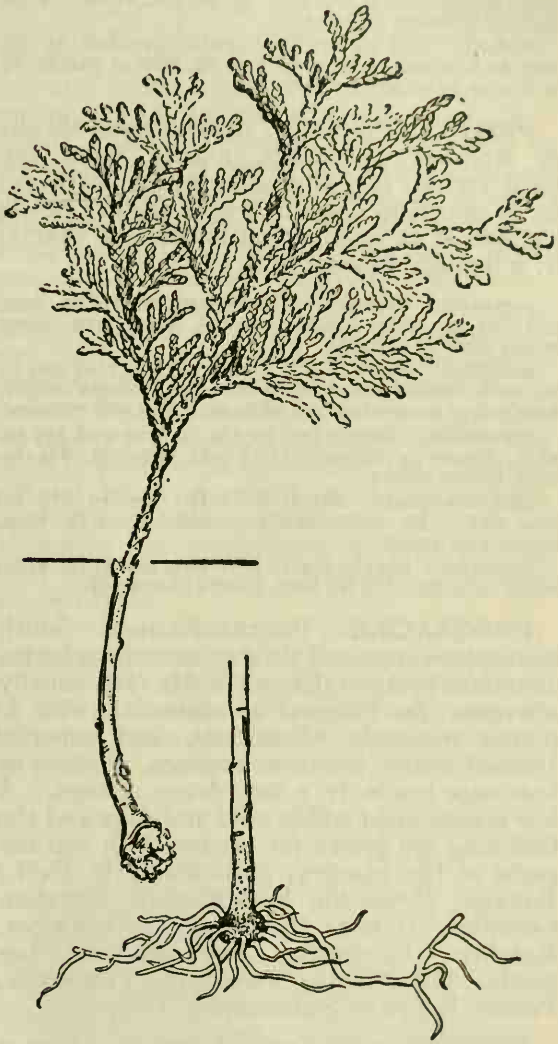


FIG. 18. Cutting of arbor-vitæ. The full cutting shows the formation of callus at base; the detail, later, has the roots well formed.

PROPHET-FLOWER: *Arnebia echioides.*

PROSOPIS. *Leguminosæ.* Trees or shrubs with 2-pinnate lvs., the lfts. usually small and numerous, greenish-yellow fls. in axillary spikes, and straight or sickle-shaped pods; the first species is of economic importance in arid regions, for forage and as a honey plant.

glandulosa (*P. juliflora* var. *glandulosa*). MESQUITE. Much branched shrub to 9 ft. or sometimes small tree to 20 ft. high, with axillary spines: spikes to 3½ in. long: pods to 8 in. long. Tex., N. Mex., S. Calif., characteristic of the region.

pubescens: *Strombocarpa odorata.*

Stephaniana. Low tree, spiny: spikes about 3 in. long: pods to 1 in. long, black. S. W. Asia.

PROSTANTHERA. *Labiatæ.* Australian shrubs with opposite lvs. and white or red 2-lipped fls.; grown out-of-doors in S. Calif. Propagated by cuttings of young wood.

lasianthos. Shrub or small tree: lvs. oblong-lanceolate, to 3 in. long, pale or glaucous beneath, margins often recurved: fls. tinged pink or blue, ½ in. long, in terminal racemes.

nivea. To 6 ft.: lvs. linear, to 1½ in. long, entire: fls. white or tinged with blue, ¾ in. across, axillary, forming leafy racemes.

rotundifolia. To 7 ft.: lvs. broad-ovate, to ½ in. long, nearly entire: fls. blue or purple, about ½ in. long, in terminal racemes.

Sieberi. Tall shrub: lvs. ovate-lanceolate or oblong, to 1 in long, deeply toothed: fls. blue or purple, ⅓ in. across, in terminal racemes.

PROTEA. *Proteaceæ.* African trees, shrubs or stemless perennials, mostly from the Cape region: lvs. alternate, entire, leathery: fls. in many-fld. usually sessile solitary heads inclosed in an involucre of imbricated bracts: fr. a densely bearded nut.

compacta. Shrub: lvs. imbricated, to 4¼ in. long and 1½ in. wide: heads terminal, 4 in. long, inner bracts pink to carmine.

mellifera. Shrub to 8 ft.: lvs. to 3½ in. long and ⅛ in. wide: heads terminal, 5 in. long, bracts sticky, dark red or greenish-white with pink tips and margins.

obtusifolia. Shrub: lvs. to 4¾ in. long and 1½ in. wide, obtuse or emarginate: heads terminal, 3¾ in. long, bracts ciliate.

scolymocephala. Shrub to 3 ft.: lvs. to 2½ in. long and ⅙ in. wide: heads terminal, to 1 in. long, bracts pale green.

Susannæ. Shrub: lvs. to 5 in. long and ¾ in. wide: heads terminal, 3¾ in. long, bracts pubescent.

PROTEACEÆ. Protea Family. South hemisphere trees and shrubs, sometimes herbs, abundant in Australia and S. Afr.: lvs. usually alternate: fls. bisexual or unisexual, with 4-parted perianth, 4 stamens, and superior 1-celled ovary, borne in racemes, clusters or bracteate heads: fr. a nut, drupe or caps. A few genera yield edible nuts and dyes and the following are grown for ornament in warmer parts of the country, particularly in Calif.: Banksia, Dryandra, Embothrium, Gevuina, Grevillea, Hakea, Hicksbeachia, Isopogon, Knightia, Lambertia, Leucadendron, Lomatia, Macadamia, Persoonia, Petrophila, Protea, Roupala, Stenocarpus, Telopea.

PRUINOSE: covered with a bloom, like a plum or a cabbage leaf.

PRUNE. Any variety of Domestica plum with firm meaty flesh, and which readily makes dried fruit. Some of the prunes are commercially grown in the East, but they are sold in the green state as are other plums; and they are adapted to all the uses of other plums. Prunes are cultivated like other plums. Fruits for drying are allowed to fall from the tree, then carefully gathered. They are dipped in lye to prevent fermentation and to hasten the drying, often being rinsed thereafter. They may then be dried in kilns, or in warm sunny regions like California on trays in the open air. In this country the product is raised and prepared on the Pacific coast. See *Plum.*

PRUNELLA (*Brunella*). *Labiatæ.* Hardy more or less weedy low-growing per. herbs, with purple or violet fls. in dense bracted heads or spikes; useful for the rock-garden or slightly shady parts of the border. They grow readily in common conditions.

grandiflora. To 1 ft.: lvs. ovate, toothed or entire: fls. purple, 1 in. long, June–July. Eu. Color forms are vars. **alba, carminea** and **rubra.**

incisa: *P. vulgaris* form.

vulgaris (*P. incisa*). Self-Heal. Heal-All. To 2 ft., sts. often procumbent: lvs. ovate to oblong-lanceolate, to 4 in. long, entire or toothed: fls. purple or violet, rarely white, to ½ in. long, May–Oct. Eu.; Asia; nat. in N. Amer. Var. **laciniata** has cut lvs.

Webbiana: hort. name for a floriferous plant with bright purple fls.; botanical position uncertain.

PRUNING. All woody plants, and practically all others, are pruned by nature if not by man. Branches arise from buds, and yet there are any number more buds on a tree or bush than can grow full-size branches. A large part of the twiglets die and fall, probably having contributed to the welfare of the plant in their short life. The trunk of a tree has shed perhaps hundreds of twigs in its course from seedling to sapling and maturity, otherwise it would not be a smooth continuous bole. Twigs in disadvantaged positions, as on the inside and under side, fail and fall, as the droppings on the ground testify. Eventually the full-formed characteristic plant is produced; its form and character constitute its charm, and this charm should be retained. The pruning of ornamental plantings, therefore, has for its object the maintenance of the plant in its normal natural condition. It may be corrected, if need be, by removing superfluous, injured and wayward growths and by keeping it within bounds; and broken, diseased and wounded places on trees should be treated and the head so directed from the first as to avoid dangerous crotches and to make it shapely. Beyond all this, the plant should be left largely alone unless, for some special reason, it is desired to trim it into a formal shape; and in this case the work should be in the hands of a trained person and not a tree butcher or a person who happens to be possessed of pruning-shears. As to trees, the knowledge of insects and diseases, and of the physiological processes, now requires educated and trained men, and trees become more valuable as property values rise and as men and women become more sensitive to their surroundings.

When it is desired to grow a product of extra size and excellence, pruning must be undertaken to reduce competition between numbers, whether the product is roses or peaches. The gardener prunes his chrysanthemums for the production of extra large blooms, and his greenhouse tomatoes for first-class fruit. No vineyardist expects an acceptable crop of fruit without pruning, nor any grower of blackberries and raspberries without at least removing the spent canes. Anybody can cut off limbs and make a great display with saws and pruning-shears, but real pruning requires discrimination and intelligent experience. Pruning is a process of educating the plant for the purpose of correcting its faults and developing its most desirable attributes.

Pruning has two objects: to trim the plant or to make it assume a designed shape; to render it more vigorous or more fruitful, or to make other changes in its character. These objectives are well illustrated in the pruning of ornamental shrubs. If one wants the shrubs sheared into formal shape, the shearing may be undertaken at almost any season; in fact, it is better to practice it two or three times each year, to keep the plants attractive and neat. If only once, it is well to perform it early in the season so that new growths may quickly arise and cover whatever damage may be wrought. If, however, the desire is to obtain more flowers, the case is very different. Some shrubs and trees bear their flowers on the wood of the preceding year. Such, for example, are the early-flowering shrubs as lilacs and snowballs. The flower-buds are made the previous year. In this case, pruning in winter cuts off the flower-buds. The proper time for pruning them, therefore, is just after the flowers have passed. The flower-buds form later in the season for the production of flowers the following spring. Other shrubs, however (particularly those that blossom late in the season), bear on wood of the current year's growth. Some kinds of clematis blossom in late summer and fall on the wood of the season. Roses present a similar case. The greater the quantity of strong wood in any season, therefore, the greater the bloom in that season. With such shrubs, it is well to prune in winter or early spring, and rather heavily. The abundance of new shoots may be expected to bear flowers later in the season. Following are shrubs which, for best results in flower-bearing, may be pruned when dormant (in winter): camellia, Jackmani type of clematis, cornus, hibiscus (shrubby), hydrangea, many loniceras or honeysuckles, philadelphus or mock-orange, some spireas. Shrubs that may be pruned when in leaf (after blooming): lilac, deutzia, weigelas, exochorda, spring-flowering loniceras, tree peony, flowering almond, some spireas and viburnums, wisteria. Fig 19 shows a plant-form that is likely to be ruined by persons who shear bushes; Fig. 20 suggests legitimate heading-back.

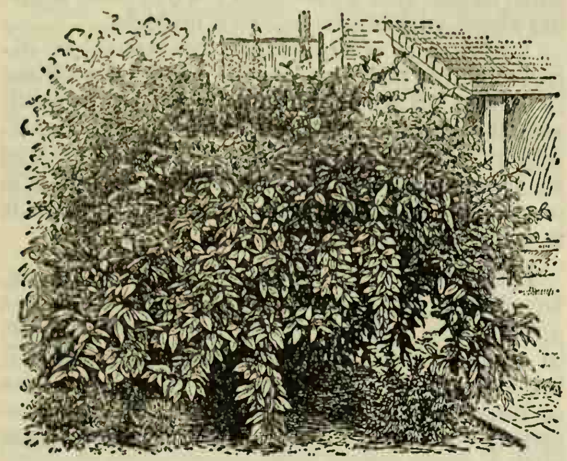


FIG. 19. Bush in its natural attractive form. A man with shears could work havoc with such a plant and yet think he was improving it by cutting off its top.

Fruit-trees must be pruned to stimulate the most promising or best-placed bearing wood and thereby to thin the fruit, to facilitate effective spraying and expeditious picking of the fruit. Pruning should be a yearly practice and then violent correction will not be necessary and the tree should be more prosperous. Heavy pruning of the top tends to the production of wood; therefore the severe cutting of orchard trees, following three or four years of neglect, sets the trees into heavy wood-bearing, and makes them more vigorous. Such treatment generally tends away from fruit-bearing. This heavy pruning is usually necessary in neglected orchards, however, to bring trees back into shape and to revitalize them; it sets up a process of renewal. Pruning should be so managed that the tops of the trees will be open, that no two limbs interfere with each other, that the fruit will not be so abundant as to overload the tree. Before one can prune a fruit-tree intelligently one must know its fruit-bearing habit and be able to distinguish fruit-buds and leaf-buds.

The wound made by pruning heals by being covered with callus tissue, which grows out from the cambium region and rolls over the face of the exposure. The hard wood itself never heals; that is, the cells do not have the power of making new cells; the old wood is covered up, or hermetically sealed as a cap is put on a fruit-jar. It is evident, therefore, that no kind of dressing will hasten the healing of the wound. The merit of a dressing is to keep the wound sound and healthy until the callus naturally covers it over. A good dressing is thick linseed-oil paint, but special kinds are on the market. A dressing should be adhesive and enduring, and have antiseptic properties. Small wounds on sound limbs or trunks are usually not dressed in orchard

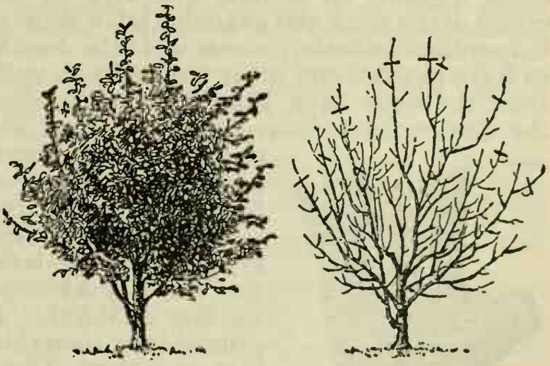


FIG 20. Fruit-tree showing (at right) the proportion to which it may be cut back if one desires a close head.

pruning. Figs. 21 and 22 explain the danger from knot-holes and long stubs.

The time or season for pruning, so far as the wound is concerned, is ordinarily in spring when the vital activities are beginning; but the season also influences fruit-bearing and wood-making, and these questions should be considered. Those wounds heal best that are on strong main limbs, where there is a full flow of nutritious sap. The limb should be cut off so that the wound is approximately parallel with the trunk on which it sits, and close to it. The longer the stub, the less rapid in general is the healing of the wound. One has only to observe the trunks of trees as one passes, or the knots in fire-wood, to understand the decay and damage that result from long stubs, whether left by the pruner or by storms, for knot-holes are only decayed branches. The injury may invade the trunk far beyond the knot-hole.

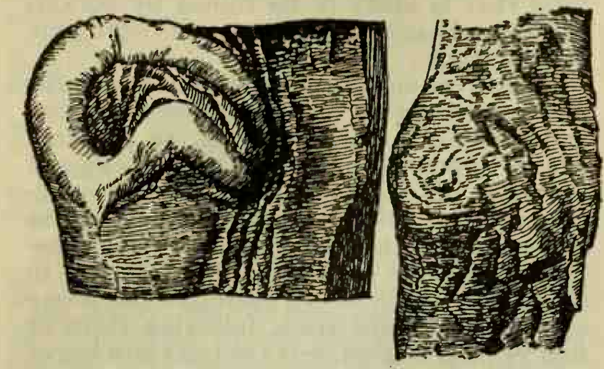


Fig. 21. A knot-hole that can never soundly heal. A knot that has been covered by healing tissue.

It is generally best to prune hardy orchard trees late in winter or early in spring, but much depends on climate and also on the extent of the work and available labor supply. It is ordinarily better, however, in the North, to leave peaches and other tender fruits until after the buds have swollen, or even after the flowers have fallen, that one may determine how much they have been injured by the winter. Grape vines should be pruned in winter or not later (in the North) than the first of March. If pruned later than this, they may bleed. These remarks may be made to apply to other woody plants as well as to fruit-trees.

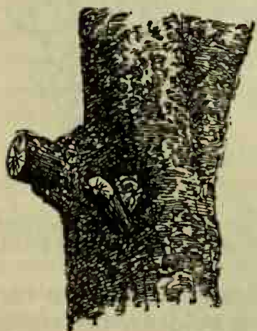


Fig. 22. Stubs that can never heal.

Tree surgery, or the treating of wounds, depredations and damages, is a different practice from pruning although pruning may be involved in it. Special knowledge and equipment are required for it.

Pruning and trimming should be contrasted although they are ordinarily confounded. Trimming is an affair of the shaping of plants and not to the thinning of them, or to training for wood, fruit or other special object. Trimming is mostly employed on hedges. It is also practiced to keep evergreens in shape. Many ornamental plants are also trimmed into various forms, although it is a question whether such practice is often desirable. Fruit-trees should be pruned, as a rule, rather than trimmed: they should be allowed to take their natural form, the pruner taking out the superfluous and unnecessary wood and keeping them within manageable bounds.

Training is still another practice. It directs the parts, often placing them on trellises or walls. The plant must first be pruned, and the nature of the pruning may be modified by the form of training. If grapes are to be trained on the Kniffin system, pruning is one thing; if on the horizontal-arm system it is quite another thing.

PRUNUS. The Stone-Fruits. *Rosaceæ.* Interesting deciduous and evergreen trees and bushes, mostly of the north temp. zone, of many kinds, with alternate and prevailingly simple lvs.: fls. normally bisexual, white or pink, solitary or in clusters and often preceding the foliage: fr. a drupe, mostly edible, with a single pit or stone.

For this Hortus it seems best to keep the genus Prunus intact, to include the plums, apricots, peaches, cherries, and cherry-laurels. (See comments under *Malus*). The cherry species fall into several groups, of which three may be mentioned: the umbellate, in which the flowers are in small umbel-like clusters, as in the orchard kinds, although in some cases they may be only 1, 2 or 3; the racemose cherries, with the flowers in distinctly elongated clusters or racemes, as the choke-cherry; the cherry-laurels, with flowers racemose and leaves persistent (evergreen).

All the prunus plants are tractable in cultivation. Most of the kinds are hardy in the northern parts of the country. They are not particular as to soil. Most of them are propagatable directly from seeds sown in autumn or stratified until spring. Named varieties are started from firm-wood cuttings under glass or are budded on closely related stock, commonly the latter. The commonest stocks are common plum, myrobalan plum, peach, cherry. Note the statements under some of the species in this account, and consult *Almond, Apricot, Cherry, Peach, Plum.*

acida: *P. Cerasus* var. *caproniana.*

alabamensis. Racemose cherry like *P. serotina* but a smaller tree, the lvs. underneath as well as petioles and rachis of raceme tomentose or pubescent, lvs. relatively broader. Ala.

alleghaniensis. Plum: shrub or small tree: lvs. lance-ovate to narrow-obovate, long-pointed, serrate, becoming glabrous: fls. about ½ in. across, white turning pink, calyx somewhat pubescent outside: fr. about ½ in. diam., dark purple and glaucous. Conn. to Pa.

americana. Small native plum tree 20–30 ft. or much less: lvs. obovate or oblong-obovate and acuminate, dull, sharp-serrate, petiole usually glandless: fls. about 1 in. across, calyx-lobes not glandular: fr. about ¾ in. diam., but in some strains larger, yellow or red, stone swollen. New England to Man., west and south.—Blackhawk, Hawkeye, DeSoto and other plums belong here. Var. **lanata** has lvs. and twigs soft-pubescent.

Amygdalus: *P. communis.*

angustifolia. Chickasaw Plum. Small twiggy glabrous tree or a bush: lvs. lanceolate, standing trough-like, shining, closely fine-serrate: fls. ⅓ in. across, white: fr. about ½ in. diam., red or yellow. Del., west and south to Fla. and Tex.—Produces Caddo Chief. Var. **Watsoni.** Sand Plum of Kans. southwest. Bush, with very zigzag twigs.

apetala (*P. ceraseidos*). Small tree or shrubby: lvs. oblong to obovate, to 2 in. long, acuminate, sharp-serrate, pubescent: fls. with small petals soon perishing, the calyx purple, with the lvs. Japan.

Armeniaca. Apricot. Small tree with ovate to round-ovate, often cordate, abruptly pointed, closely serrate lvs. pubescent on veins underneath: fls. 1 in. or less across, pinkish or white, solitary in advance of lvs.: fr. large, becoming nearly smooth with very short st.; stone mostly smooth. Perhaps China, or W. Asia. Var. **mandshurica.** Lvs. more cuspidate, sharply serrate: fr. with st. about ¼ in. long. Var. **sibirica.** Lvs. narrower and smaller, long-acuminate: fr. small and scarcely edible, splitting.

Arnoldiana: see *P. triloba.*

avium. Sweet Cherry. Large tree with central leader and birch-like bark: lvs. oblong-ovate to -obovate, large, soft, doubly serrate: fls. about 1 in. across, with the lvs. in clusters, white: fr. globular or oblong, long-stemmed. Eurasia.—Often spontaneous in the form known as Mazzard, the seedlings used as stocks. There are double-fld., cut-lvd. and drooping forms. Var. **duracina.** Bigarreau or Hard-fleshed Cherries. Var. **Juliana,** Heart Cherries. Var. **regalis** (*P. effusa*), Duke Cherries, with narrow growth and sour flesh, thought to be hybrid with *P. Cerasus.*

azorica: *P. lusitanica.*

Besseyi. Sand Cherry. Glabrous little bush, diffuse or nearly prostrate: lvs. elliptic to oval, finely serrate: fls. about ⅓ in. across, white: fr. about ½ in. diam. or more, black, edible. Plains, Man. to Kans. and Colo.—Sometimes employed as stock for hardiness and for dwarfing.

Blireana: see *P. cerasifera.*

brigantiaca. Apricot: small tree or shrub: lvs. ovate, short-acuminate, sharply serrate, pubescent underneath: fls. short-stalked, white or pink, about ½ in. or more across: fr. small, yellow, smooth, subacid. S. France.

Buergeriana. Racemose cherry, 20–30 ft.: lvs. elliptic to oblong and acuminate, serrulate, glabrous except in axils underneath: fls. about ¼ in. across: fr. small, black. Japan, Korea; hardy N.

campanulata. Handsome umbellate cherry to 25 ft., young growth glabrous: lvs. oblong-ovate, sharply serrate, acuminate, nearly or quite glabrous underneath: fls. with the lvs. or in advance of them, long-pedicelled, calyx and corolla dark deep rose-red: fr. ovoid, about ½ in. long, red. S. Japan; thrives in S. Calif.

canescens. Shrubby cherry with pubescent branchlets and lvs., the latter ovate or longer, short-acuminate, serrate: fls. 2–5 together, nearly ½ in. across, pink: fr. about ½ in. diam., red. China; hardy N.

Capollin: *P. serotina* var. *salicifolia.*

caroliniana (*Laurocerasus caroliniana*). Native evergreen cherry-laurel to 40 ft. or more: lvs. oblong-lanceolate and acuminate, nearly or quite entire: fls. small, cream-white, in racemes: fr. ½ in. or less long, shining black. N. C. to Tex., mostly near coast.—Known as Wild-Orange and Mock-Orange.

ceraseidos: *P. apetala.*

cerasifera. Cherrv or Myrobalan Plum. Slender small tree glabrous or essentially so at maturity: lvs. small and thin, 2 in. long, short-ovate, finely serrate: fls. 1 in. or less across, white, single or 2 or 3 together, before lvs.: fr. mostly 1 in. or less diam., globular, red or yellow, sweet, very juicy. S. W. Asia.—Much used as stock. Runs into more or less weeping and leaf-margined forms. Var. **divaricata** (*P. divaricata*) is more bush-like, branches very slender, lvs. rounded at base, fls. smaller and coming with the lvs. Var. **Pissardi** is purple-lvd.; several derivatives of it are listed, as *P. Blireana* (supposed to be hybridized with *P. Mume*), *P. Hessei, P. Moseri, P. Veitchii.*

cerasoides (*P. Puddum*). Like *P. campanulata* but lvs. broad-oval and very sharply toothed: fr. pointed. Himalaya.

Cerasus. Sour Cherry. Small round-topped or much spreading variable tree, suckering from root: lvs. short-ovate to somewhat obovate, stiffish, abruptly short-pointed, doubly serrate: fls. about 1 in. across, white, a little in advance of lvs. or with them: fr. ¾ in. or so diam., red, sour. Eurasia; sometimes spontaneous.—There are double- and pink-fld. forms. Much cult. as an orchard fr. in two forms,—var. **austera** or Morello with colored juice and var. **caproniana** (*P. acida*) or Amarelle with light or uncolored juice. Var. **Rhexii** has double white fls. Var. **semperflorens,** Everblooming or All Saints Cherry, blooms on shoots of the season, in summer.

Chamæcerasus: *P. fruticosa.*

cistena. Purpleleaf Sand Cherry. Hybrid between *P. pumila* and *P. cerasifera* var. *Pissardi:* lvs., pedicels and calyx reddish.

Cocomilia. Often bushy, with thorny branches: lvs. oval to obovate, sharp-serrate, tapering at base: fls. mostly in pairs, whitish, about ½ in. across: fr. about 1 in. or less diam., yellow. Italy.—Allied to *P. cerasifera.*

communis (*P. Amygdalus* and *Amygdalus communis*). Almond. Glabrous tree to 25 ft.: lvs. oblong-lanceolate and acuminate, closely serrate, somewhat shining above: fls. mostly before lvs., 1½ in. or less across, pink: fr. oblong and flattened, 1½ in. or more long, with dry inedible flesh, varying in thickness of stone and edibleness of kernel. Probably W. Asia.—There are double-fld. forms in different tints, variegated-lvd. and pendulous.

concinna. Umbellate bush cherry, becoming nearly or quite glabrous in all parts: lvs. narrow, to 1 in. wide, with not more than 10 pairs of veins, finely serrate: fls. 1 in. or less across, 4 or fewer together, white, before the lvs.: fr. about ½ in. long, black. China.—Ornamental.

Conradinæ. Umbellate cherry allied to *P. concinna*, tree to 25 ft., glabrous or nearly becoming so: lvs. 2 in. or so broad, with more than 10 pairs of veins: fls. 4 or fewer together, whitish or pinkish, nearly 1 in. across: fr. nearly ½ in. long, red. China.

cornuta. Like *P. Padus*, of which some writers consider it a var., but has lvs. rounded at base, reddish hairs in axils underneath, commonly pubescent racemes, calyx glabrous inside, and stone smooth. Himalaya.

cuneata: *P. susquehanæ.*

dasycarpa. Purple Apricot. Small tree like apricot, to 20 ft., branches purplish: lvs. plum-like, ovate to oval, to 2½ in. long, closely serrate, usually pubescent on veins underneath: fls. 1 in. or more across, white, before the lvs.: fr. 1½ in. diam., pubescent, dark purple, acid. Unknown wild; perhaps a hybrid.

Davidiana. Peach-like: glabrous tree to 20 or 30 ft.: lvs. narrow and willow-like, finely serrate: fls. 1 in. or more across, white or light pink, very early and often taken by frost, sessile: fr. about 1 in. diam., pubescent, flesh dry. China; hardy N.—Has been used as a stock.

dehiscens. Glabrous bush of the dwarf almond group with more or less spiny branches: lvs. small and narrow, not much exceeding 1 in. long, finely crenate: fls. 1 in. across, solitary and sessile: fr. nearly 1 in. diam., very tomentose, splitting. China; hardy in some of the northern states.

demissa: *P. virginiana* var.

depressa (*P. pumila* var. *depressa*). Prostrate dwarf cherry on beaches and shores, Que. to Mass. and Ont., probably not in general cult. but to be distinguished from *P. pumila:* lvs. less acuminate and thinner, more glaucous underneath: fr. small with ellipsoidal stone.

Dielsiana. Umbellate cherry, tree to 30 ft. or sometimes bushy, much like *P. Pseudocerasus:* fls. pink or white, before the lvs., 3–5 in an involucrate cluster, bracts fimbriate, calyx-lobes longer than the tube: fr. small, red. China.

divaricata: *P. cerasifera* var.

domestica. Common Plum. Small tree, with twigs more or less pubescent at least when young: lvs. ovate to obovate, rather thick, dull green, pubescent underneath: fls. 1 in. or less across, whitish, solitary or few together and mostly in advance of lvs.: fr. various, mostly oblong or ovoid. Eurasia; sometimes spontaneous. Var. **insititia.** Damson, Bullace. Usually a more compact grower: lvs. smaller: fr. much smaller, often in clusters.

effusa: *P. avium* var. *regalis.*

emarginata. Allied to *P. pennsylvanica* but a smaller tree or a shrub, lvs. obtuse or only acute and closely or indistinctly serrulate, often pubescent underneath: fr. about ⅓ in. diam., becoming black. N. Ariz. to B. C.

fruticosa (*P. Chamæcerasus*). European Dwarf or Ground Cherry. Bush 3–4 ft., glabrous or becoming so: lvs. oval to oblanceolate or narrow-obovate, about 2 in. long, closely serrate: fls. ¾ in. across, white, with the young foliage: fr. about ⅓ in. across, red-purple. Eu., Siberia.—Sometimes worked on tall or standard stocks.

glandulosa. One of the flowering almonds, but properly a cherry: shrub 3–5 ft.: lvs. oblong to ovate-oblong, broadest at about the middle or sides nearly parallel, not acuminate, apex blunt: fls. white to pink: fr. about ⅓ in. diam., red. Japan, and probably China. —Common in cult., usually double. Var. **rosea** has pink fls. Var. **sinensis** has double pink fls. and lanceolate or oblong-lanceolate lvs.

gracilis. Oklahoma Plum. Bush to 15 ft., with oval or ovate-elliptic lvs. slightly pubescent above and densely so underneath: fls. about ⅓ in across, white, preceding the lvs.: fr. about ½ in diam., reddish with thin bloom. W. Ark. to N. Tex.; hardy N.

Grayana. Somewhat like *P. Padus*, but lvs. with setaceous teeth and long point, the petiole not glandular: tree to 30 ft.: fls. about ⅓ in. across, white, in racemes: fr. about ¼ in. diam., black. Japan; hardy N.

Hessei: see *P. cerasifera.*

hortulana. Hortulan Plum. Tree to 30 ft., not forming thickets, glabrous or lightly pubescent on veins on under side of the obtusely serrate lvs. which are oblong-obovate to elliptic and long-acuminate: fls. preceding lvs., about ½ in. across, white: fr. 1 in. or less diam., red to yellow. Ky., Tenn. to Iowa and Okla. —Parent of Cumberland, Golden Beauty, Wayland and other orchard plums. Var. **Mineri** has thicker and duller coarsely toothed lvs. and late firmer fr.; here belong Miner, Clinton and other plums.

humilis. Bush cherry to 4 or 5 ft.: lvs. 2 in. or less long, elliptic-ovate and somewhat acute, serrulate, glabrous: fls. appearing with lvs., solitary or in pairs, white to pinkish, ½ in. across: fr. ½ in. long, red. China; hardy N.

ilicifolia. Islay. Evergreen glabrous shrub or tree to 30 ft.: lvs. 2 in. or less long, spiny-toothed and holly-like: fls. about ⅓ in. across, white, racemose: fr. ⅔ in. or less diam., dark red to nearly black. S. Calif.

incana. Bush cherry, 3–6 ft.: lvs. small, variously oblong, obtuse or short-pointed, serrate, tomentose underneath: fls. with the lvs. or just in advance, ½ in. across, rose: fr. about ¼ in. diam., red. S. E. Eu. and W. Asia; hardy N.

incisa. Small cherry tree or big bush: lvs. ovate to obovate and acuminate, double-serrate, pubescent both surfaces: fls. with the lvs., nodding, red and pink, short-pedicelled, less than ½ in. across: fr. about ¼ in. long, purple-black. Japan; hardy N.

injucunda: *P. umbellata* var.

insititia: *P. domestica* var.

integrifolia: *P. Lyoni.*

Jacquemontii. One of the flowering almond or dwarf cherry kind, shrub-like, glabrous, to 10 or 12 ft.: lvs. elliptic to obovate, acute, serrate: fls. in advance of lvs., about ⅓–½ in. across, pink; fr. about ½ in. diam., red. Himalaya.

japonica. A dwarf flowering cherry, known as flowering almond, closely allied to *P. glandulosa* but less frequent in cult. and differing in ovate sharply serrate lvs. broadest below the middle: fls. about 1 in. across, blush or pink, usually double in cult.: fr. ⅓–½ in. diam., red. China.

lanata: *P. americana* var. at least in part; the status of *P. lanata* requires further study.

Lannesiana. One of the handsome Japanese flowering cherries, known in many double forms, differing from *P. serrulata* by the long-aristate or awned teeth of the lvs.: fls. pink or white and fragrant. Japan.—A large tree.

Laurocerasus (*Laurocerasus officinalis*). Cherry-Laurel. Evergreen bush or small tree: lvs. oblong, remotely small-toothed, shining and thick: fls. about ⅓ in. across, white, very fragrant, in racemes not longer than the lvs.: fr. about ½ in. long, dark purple. S. E. Eu. to Persia.—Much planted in southern states and Calif. There are many leaf-forms and others, as *angustifolia, caucasica, Bertinii, japonica, latifolia, magnoliæfolia, parvifolia, rotundifolia, schipkaensis, serbica, versaillensis, Zabeliana.*

lobulata. Cherry, to 35 ft.: lvs. oblong to obovate, acuminate, sharply double-serrate, hairy underneath on veins: fls. preceding lvs., white: fr. about ⅓ in. diam., red. China.

lusitanica (*P. azorica*). Portugal-Laurel. Much like *P. Laurocerasus*, but tree larger, lvs. crenate-dentate and racemes surpassing the lvs. Portugal, Spain; planted far S. Leaf forms are *angustifolia, myrtifolia, variegata.*

Lyoni (*P. integrifolia*). Islands Cherry. Evergreen bushy tree to 30 ft.: lvs. ovate to ovate-lanceolate, acute, margins entire or on young shoots denticulate: fls. about ¼ in. diam., white, in axillary racemes: fr. 1 in. or more diam., dark purple. Isls. of S. Calif., and planted in the region.—By some considered to be a form of *P. ilicifolia.*

Maackii. Racemose cherry, to 50 ft., parts pubescent or becoming nearly glabrous: lvs. oblong to elliptic-ovate, acuminate, sharply glandular-serrate: fls. white, about ⅓ in. across: fr. about ¼ in. diam., black. Manchuria, Korea, China; hardy N.

Mahaleb. Mahaleb or St. Lucie Cherry. Green-twigged tree to 30 ft.: lvs. broad-ovate to orbicular, abruptly short-pointed, 2½ in. or less long, glabrous both sides except perhaps on midrib underneath: fls. ¾ in. or less across, in umbels, white and fragrant: fr. about ¼ in. long, black. Eu. and W. Asia.—Cult. for ornament and as stock for other cherries; sometimes escaped.

mandshurica: *P. Armeniaca* var.

maritima. Beach Plum. Straggling bush or sometimes tree-like: lvs. 2 in. or less long, oval to obovate, obtuse or short-pointed, serrate, pubescent underneath: fls. about ½ in. across, white, preceding lvs.: fr. ¾ in. or less diam., red or yellow, edible. N. B. to Va., on or near coast.

Maximowiczii. Racemose cherry, tree to 50 ft.: lvs. obovate, double-toothed, acute, glabrous except perhaps on veins underneath: fls. about ¾ in. across, whitish, after the lvs.: fr. about ¼ in. diam., red to black. Manchuria, Korea, Japan; hardy far N.

melanocarpa: *P. virginiana* var.

mexicana. Big-Tree Plum. Tree to 25 ft., not suckering: lvs. large, oblong to obovate, short-acuminate, sharp-serrate, pubescent usually both surfaces: fls. ¾ in. across, white, preceding lvs.: fr. 1 in. or more long, purplish-red and glaucous. Ky. and Tenn. to Okla. and Mex.; hardy N.

mira. Peach-like: tree to 30 ft., glabrous except on midrib underneath: lvs. lanceolate and tapering, crenate-serrate: fls. about 1 in. across, 1 or 2 in a place, white, nearly sessile: fr. about 1 in. diam., tomentose, stone smooth. W. China; hardy in central states.

Moseri: see *P. cerasifera.*

Mume. Japanese Apricot. Differs from common apricot in bark greenish or gray, lvs. smaller and narrower and not cordate and long-pointed and often pubescent underneath, fr. smaller and stone mostly pitted. Japan; hardy N., particularly when worked on plum.—There are double-fld. and other forms, constituting the "flowering plums" of Japan.

Munsoniana. Wild Goose Plum. Tree to 25 ft., suckering from roots and forming thickets: lvs. rather thin, oblong-lanceolate, often trough-like, glossy above, finely serrate, mostly slightly pubescent on veins underneath: fls. ½ in. or more across, white, commonly preceding lvs.: fr. about ¾ in. long, red or yellowish, slightly glaucous. Ky., Tenn., Kans., Tex.; hardy N. in vars. Newman, Robinson and others.

myrtifolia (*P. sphærocarpa*). Myrtle-leaved Cherry-Laurel. Evergreen tree to 40 ft., glabrous: allied to *P. occidentalis* but lvs. much smaller (2–4 in. long), elliptic to ovate: fls. yellowish-white, ⅛ in. diam.: fr. subglobose, about ½ in. diam., black-purple. S. Fla., W. Indies, Mex. to Brazil.—Another *myrtifolia* is a form of *P. lusitanica.*

nana. Dwarf Russian Almond. Hardy bush to 5 ft., glabrous: lvs. stiffish and narrow, 3 in. or less long, obtuse or nearly so, serrate: fls. about ¾ in. across, with the lvs., pink to white: fr. about ¾ in. long, pubescent. Eurasia.—Sometimes grown for ornament. The name *P. nana* is applied by some writers to the choke-cherry (*P. virginiana*).

nikkoensis: *P. nipponica.*

nigra (*P. americana* var. *nigra*). Lvs. commonly broader than in *P. americana* and obtusely or closely glandular-serrate, petiole with 2 glands: fls. larger, white changing to pink, calyx-lobes glandular-serrate: fr. often larger. N. B. far west and south to N. Y. and Ill.—Yields Cheney, Itaska and other orchard vars.

nipponica (*P. nikkoensis*). Umbellate cherry allied to *P. incisa*, but petioles glabrous rather than pubescent, pedicels longer (to 1 in.), fls. twice larger: bushy tree to 20 ft. with ovate long-acuminate lvs. and white or pale pink bloom. Japan; hardy N.

occidentalis (*Laurocerasus occidentalis*). West Indian Cherry-Laurel. Evergreen glabrous tree to 40 or 50 ft.: lvs. oblong or elliptic, 4–8 in. long, acuminate, entire: fls. white and fragrant, about ¼ in. long, in dense racemes shorter than the lvs.: fr. ellipsoid, about 1 in. long, purple. Jamaica and Cuba to St. Vincent.—The name *occidentalis* has been applied also to *P. Lyoni*.

orthosepala. Probable hybrid between *P. angustifolia* var. *Watsoni* and *P. americana:* shrub to 6 ft., with larger lvs., frs. and fls. than in *P. angustifolia*.

Padus (*Padus racemosa*). European Bird Cherry. Tree to 30 or 40 ft.: lvs. elliptic to obovate, short-acuminate, sharply serrate, glabrous except on veins underneath: fls. about ½ in. across, white, fragrant, appearing with full leafage on drooping or spreading racemes, calyx pubescent inside, petals twice longer than stamens: fr. about ¼ in. diam., black, stone sculptured. Eu. to Japan.—Planted for ornament, sometimes in pendulous, red-fld., double-fld., spotted-lvd. and other forms.

Palmeri: usually referred to *P. americana* var. *lanata*, but may be distinct.

pennsylvanica. Wild Red Cherry. Small tree to 35 ft.: lvs. ovate or oblong-lanceolate, long-pointed, finely toothed, glabrous: fls. ½ in. across, in umbels, white: fr. ¼ in. across, red. Newf. to N. C., west to Colo.

Persica (*Amygdalus Persica. Persica vulgaris*). Peach. Small glabrous tree: lvs. long-lanceolate, finely serrate: fls. solitary in advance of foliage, sessile, 2 in. or less across, pink: fr. ⅓ in. diam., pubescent, stone pitted and wrinkled. China.—Cult. for edible fr. and also in ornamental forms as double-fld., purple-lvd., dwarf, pyramidal, pendulous. Sometimes spontaneous. Var. **compressa** (var. *platycarpa*), Flat and Peen-to Peach, fr. flattened endwise. Var. **nucipersica**, Nectarine, fr. smooth.

pilosiuscula. Umbellate cherry: shrub or tree to 40 ft.: lvs. obovate to oblong, acuminate, serrate, pubescent on veins underneath: fls. with the lvs. or just preceding them, about ¾ in. across, pink: fr. about ⅓ in. long, red. China, hardy in parts of N.

Pseudocerasus. Small cherry, to 25 ft., with much the look of *P. Cerasus*: lvs. ovate to broad-ovate, firm, more or less pointed, sharp-serrate, somewhat hairy on veins underneath: fls. just in advance of full foliage, 1 in. or less across, white and fragrant: fr. a very early red edible cherry ¾ in. or less diam. China.—Now intro. for experimental purposes.

pubigera. Like *P. Padus:* lvs. minutely serrulate: fls. smaller, the petals nearly as long as stamens; stone smooth. W. China.

Puddum: *P. cerasoides*.

pumila. Sand Cherry. Decumbent at base when old but growths erect 3–5 ft., all parts glabrous: lvs. narrow-oblanceolate to oblong-lanceolate and mostly acuminate, 2–3 in. long, margins closely serrate toward apex, lighter underneath: fls. white, slender-pedicelled, mostly 2–3 together with the lvs., ½ in. or more across: fr. about ⅓ in. across, purple-black, stone subglobose. Sandy shores, Great Lakes.—See *P. depressa* and *P. susquehanæ*.

Reverchonii. Hog Plum. Shrub to 6 ft., forming thickets: lvs. ovate-lanceolate to lanceolate, acuminate, conduplicate, glandular-serrate, somewhat pubescent underneath: fls. with or before the lvs., white, about ⅓ in. across: fr. about ¾ in. diam., yellow to red. Okla., Tex.

rufa. Like *P. campanulata* but young parts densely reddish-tomentose, lvs. narrower and glandular-serrate. Himalaya.

sachalinensis: *P. serrulata* var.

salicina (*P. triflora*). Japanese Plum. Small tree to 25 ft.: lvs. oblong-obovate or -ovate, pointed, usually shining above and not conspicuously rugose, closely serrate, mostly glabrous underneath: fls. ¾ in. or less across, mostly in advance of lvs., white: fr. various, yellow or bright red, often pointed. China.—Cult. in several orchard vars.

Sargentii: *P. serrulata* var. *sachalinensis*.

sericea. Racemose cherry, to 50 ft. or more: lvs. elliptic to obovate, pointed, silky underneath: fls. about ⅓ in. across: fr. ½ in. or more long, black. China.

serotina. Wild Black Cherry. Large forest tree: lvs. oblong to lanceolate to oval, acuminate, with appressed callous teeth, nearly or quite glabrous underneath: fls. white, about ¼ in. across, with the lvs., in racemes, fragrant: fr. ½ in. or less diam., purple-black. N. S. to Dak., Fla. and Tex.—Leaf-forms and habit-forms are in cult. Var. **salicifolia** (*P. Capollin*) is a narrow-lvd. form of trop. Amer.

serrulata. One of the Japanese flowering cherries (see *P. Lannesiana, P. Sieboldii, P. subhirtella, P. yedoensis*). Tree to 60 ft. and more: lvs. ovate or narrower, long-acuminate, acutely or short-aristate serrate, somewhat glaucous underneath: fls. white but with many pink double forms, not fragrant, 1½ in. or less across, in clusters with fimbriate bracts, with or in advance of foliage: fr. size of pea, black. Japan, Korea, China.—Cult. in many vars. Var. **sachalinensis** (*P. Sargentii*). Lvs. broader and more coarsely serrate: fls. single, pink to white.

sibirica: *P. Armeniaca* var.

Sieboldii. Small tree, like *P. serrulata* but branchlets and under side of lvs. soft-pubescent: fls. pink or white, single and double. Japan, but unknown wild.—Includes the plant known as *P. Watereri.*

Simonii. Apricot Plum. Narrow-headed glabrous tree to 25 ft.: lvs. narrow-obovate, dull, rather thick, trough-like, obtusely serrate: fls. nearly sessile, preceding lvs., white, about ¾ in. across: fr. 1–2 in. diam., flattened lengthwise, dull red, flesh yellow, with strong flavor. China.

sinensis: applied to dwarf flowering almonds, particularly to *P. glandulosa*.

sphærocarpa: *P. myrtifolia*.

spinosa. Sloe. Blackthorn. Thorny suckering bush, or tree to 10 or 12 ft.: lvs. many and small, obovate to ovate, obtuse, serrate, pubescent or glabrous underneath: fls. ¾ in. or less across, white, before the lvs.: fr. about ½ in. diam., blue to black, glaucous. Eu., N. Afr., W. Asia.—Planted for ornament; fls. sometimes double, sometimes purple-lvd.

ssiori. Racemose cherry, to 50 ft. or more: lvs. oblong to obovate, acuminate, aristate-serrate, nearly glabrous underneath: fls. white: fr. about ⅓ in. across, black. N. E. Asia; hardy N.

subcordata. Pacific Plum. Tree to 25 ft., or sometimes shrubby: lvs. broad-ovate to orbicular, obtuse or nearly so, serrate, pubescent or becoming glabrous underneath: fls. white to rose, ⅔ in. across, before lvs.: fr. 1 in. more or less diam., red or yellow, edible. Calif., Ore. Var. **Kelloggii**, Sisson Plum, lvs. not cordate and glabrous, fr. larger.

subhirtella. Rosebud Cherry. Small tree to 25 or 30 ft., sometimes bushy: lvs. lanceolate to ovate, short-pointed, double-serrate, hairy on veins underneath: fls. in profusion, pink to nearly white, about ¾ in. across, before the lvs., petals notched: fr. about ⅓ in. diam., black. Japan; hardy N. Var. **pendula** has crooked drooping branches.

susquehanæ (*P. pumila* var. *susquehanæ. P. cuneata*). Erect to 3 or 4 ft.: lvs. short, mostly short-obovate or spatulate to elliptic-ovate, toward apex bearing appressed teeth: fls. with the lvs., white, about ⅓ in. across: fr. about ¼ in. diam. Woods, hills and shallow bogs, Me. to Penn. and Man.

tomentosa. Bush cherry or very small tree: lvs. broad-oval to -obovate, 2½ in. or less long, short-pointed or obtuse, serrate, tomentose underneath and on young growths: fls. nearly sessile, just before the lvs., ¾ in. across, white or tinted: fr. about ¾ in. diam., reddish, edible. China; hardy N.

trichostyla: a form of *P. glandulosa*.

triflora: *P. salicina*.

triloba. One of the plants known as flowering almond: bush, but sometimes tree-like and 10 ft. or more: lvs. broad-ovate to obovate, sometimes 3-lobed on shoots, double-serrate, hairy both sides: fls. 1½ in. or less across, pink or white, before the lvs.: fr. about ½ in. diam., red, pubescent. China.—Cult. mostly in double-fld. forms, worked on plum stocks. *P. Arnoldiana* is a hybrid between this species and *P. cerasifera:* differs from *P. triloba* in its white fls. that appear with the lvs. and on longer pedicels.

umbellata. Plum, bush or small tree, the branchlets glabrous or becoming so: lvs. narrowly elliptic-acuminate, 1½–3 in. long, closely serrate, more or less pubescent underneath: fls. white, few together in advance of lvs.: fr. ½–¾ in. across, yellow to purple. S. C. to Fla. Var. **injucunda** (*P. injucunda*), N. C. to Miss., has pubescent twigs and stone more pointed at either end.

Veitchii: see *P. cerasifera;* also applied to a form of *P. serrulata.*

virginiana. Choke-Cherry. Shrub, sometimes tree-like: lvs. elliptic to obovate, short-acuminate, finely serrate, glabrous or nearly so underneath: fls. about ⅓ in. across, white and somewhat fragrant, in racemes with the lvs.: fr. ⅓ or ¼ in. diam., red sometimes yellow. Newf. to Sask., N. C. and Kans. Var. **demissa** (*P. demissa*)., Wash. to Calif., has lvs. pubescent underneath. Var. melanocarpa (*P. melanocarpa*), N. D. to B. C. and New Mex., lvs. mostly smaller, fr. nearly black, petioles glandless.

Watereri: *P. Sieboldii.*

Watsoni: *P. angustifolia* var.

yedoensis. Like *P. serrulata*, but lvs. hairy or pubescent at least on veins underneath: fls. single, white or pink, pedicels and perhaps calyx pubescent, calyx-lobes sharp-serrate. Japan.

PSEDERA: *Parthenocissus.*

PSEUDERANTHEMUM. *Acanthaceæ.* Trop. herbs or shrubs with opposite lvs. and tubular 5-lobed fls. subtended by linear bracts, in spikes or racemes; grown in the greenhouse, and in the open in warm countries. Propagated by cuttings.

atropurpureum (*Eranthemum atropurpureum*). Shrub to 4 ft.: lvs. ovate or oval, obtuse or nearly so, to 6 in. long, entire, purple or sometimes green spotted with yellow: fls. white with purple center or purplish, ⅓ in. long and to 1 in. across, in narrow clusters, corolla-lobes broad and mostly blunt. Polynesia.—Now commonly planted in the American tropics.

bicolor (*Eranthemum bicolor*). Shrub to 3 ft.: lvs. ovate, to 8 in. long, entire, dark green: fls. white spotted purple, salverform, to 1½ in. long and 1 in. across. Polynesia.

kewense. Another plant described and figured as *atropurpureum* but differing in narrower and acuminate lvs., terminal spikes rather dense and broad, corolla-lobes narrow, ciliate, white with rose at base. Solomon Isls.—Probably not planted within our area.

reticulatum (*Eranthemum reticulatum*). Shrub to 3 ft.: lvs. ovate-lanceolate, to 10 in. long, wavy-margined, dark green veined with yellow: fls. white spotted purple, ½ in. long and 1½ in. across. Polynesia.

tuberculatum (*Eranthemum tuberculatum*). Small shrub, branches with many small rough elevations: lvs. elliptic, to 1 in. long: fls. white, to 1½ in. long and 1 in. across, solitary. Polynesia.

PSEUDOBULB: the thickened or bulb-form stems of certain orchids, the part being solid and borne above ground.

PSEUDOCYCAS. A genus of fossil plants. For the living plant known as *P. Micholitzii*, see *Cycas.*

PSEUDOCYDONIA: *Chænomeles sinensis.*

PSEUDOLARIX. *Pinaceæ.* One deciduous tree native in China. **P. amabilis** (*P. Fortunei. P. Kaempferi*). Golden-Larch. To 130 ft.: lvs. in dense clusters, linear, to 3 in. long, light green turning bright yellow in autumn: cones hanging, ovate, to 3 in. long, the scales deciduous and thus differing from Larix as well as in the clustered staminate fls. Var. **nana** is a dwarf form. For cult. see *Conifers.*

PSEUDOPANAX. *Araliaceæ.* Shrubs or small trees native in New Zeal. and S. Amer., with variable (dimorphous) simple or compound lvs., diœcious fls. in umbels, and drupaceous frs.; grown under glass or out-of-doors in mild climates, as Calif. For cult. see *Polyscias.*

chathamicum. To 25 ft.: lvs. simple, of 2 forms, the mature lvs. linear-obovate, to 8 in. long, slightly wavy-toothed: fr. globose. New Zeal.

crassifolium (*Aralia crassifolia. Panax crassifolium*). Tree to 50 ft.: lvs. of young unbranched plants very narrow-linear and rigid, toothed, to 3 ft. long, those of mature plants often of 3 or 5 broader lfts.: fls. in terminal compound umbels: fr. globose. New Zeal. Var. **trifoliolatum** has 3–5 lfts.

discolor. To 15 ft., much branched: lvs. of 3–5 obovate lfts. to 3 in. long, sharp-toothed, yellowish-green or bronzy, leathery: fr. oblong. New Zeal.

ferox (*Panax ferox*). To 20 ft.: lvs. simple but variable, very thick and stiff, from narrow-linear to obovate, on young plants 12–18 in. long and 1 in. or less broad and strongly toothed, those on old plants shorter and entire except perhaps near tip: fr. oblong. New Zeal.

Lessonii (*Panax Lessonii*). To 20 ft., much branched: lvs. of 3–5 obovate lfts. to 4 in. long, entire or wavy-toothed, shining and leathery: fr. oblong. New Zeal.

PSEUDOPHŒNIX. *Palmaceæ.* Unarmed feather-palms, with staminate and hermaphrodite fls. in the same infl., spadices among the lvs. and branching, 1 species on certain of the Fla. Keys, the Bahamas, and southward where there may be other species: fls. on slender pedicels; stamens 6, the expanded filaments somewhat united at base: fr. a globose 2- or 3-lobed orange-scarlet drupe. See *Palm.*

Sargentii: *P. vinifera.*

vinifera (*P. Sargentii*). Tree to 25 ft., the trunk variously swollen and more or less curved or oblique: lvs. 5–6 ft. long, the lateral ones arching; pinnæ many, closely placed, 12–20 in. long and 1 in. or less broad, stiffish, with thickened edges, lighter colored underneath: fr. ¾ in. or less diam., in heavy clusters much shorter than the lvs. Frequently planted in S. Fla.

PSEUDOTSUGA. *Pinaceæ.* Tall evergreen trees with flat linear lvs. having 2 white bands below, and drooping cones with deciduous scales and conspicuous exserted bracts; native in W. N. Amer. and E. Asia. For cult. see *Conifers.*

Douglasii: *P. taxifolia.*

glauca: *P. taxifolia* var.

japonica. Lvs. notched at apex, glossy: cones to 2 in. long. Japan.

macrocarpa. Bigcone-Spruce. Branches usually drooping: lvs. acute, bluish-green: cones to 7 in. long. S. Calif.

mucronata: *P. taxifolia.*

sinensis. Lvs. notched at apex: cones to 2½ in. long. W. China.

taxifolia (*P. Douglasii. P. mucronata. Picea Douglasii. Abies taxifolia*). Douglas-Fir. Lvs. obtuse, dark or bluish-green: cones to 4½ in. long. B. C. to Mex. and Tex.—A major timber tree in the regions of its best development. The Rocky Mt. form, which is sometimes considered a separate species, is hardy and adaptable for ornament in N. Y. and Cent. New England. Some of the hort. vars. are: **argentea**, lvs. silvery-white; **brevibracteata**, smaller tree with bracts of cone shorter; **cæsia**, lvs. bluish-green; **compacta**, compact form with shorter lvs.; **fastigiata**, pyramidal form; **Fretsii**, lvs. shorter and broader; **glauca** (*P. glauca*), with smaller lvs. and cones, the Rocky Mt. form, and **glauca pendula** with drooping branchlets and bluish lvs.; **globosa**, dwarf and globose; **pendula**, branches drooping, lvs. dark green; **viridis**, lvs. green, cones larger.

PSIDIUM. Guava. *Myrtaceæ.* Trop. American trees and shrubs with opposite simple lvs., large white fls. with many stamens, and berry-like fr. crowned with the persistent calyx-lobes; grown in Fla. and tropics for the edible frs., from which jellies and conserves are also made.

Guavas require tropical temperatures, although they withstand a few degrees of frost. The strawberry guava grows wherever the orange thrives, and the requirements are simple. Any soil is satisfactory. Trees should be set 10 to 15 feet apart. Propagated by seeds sown in flats or pans of light sandy loam; seedlings should be kept in pots until transplanted permanently. Shield- and patch-budding should be employed for choice varieties. Cuttings may also be taken.

Araca: *P. guineense.*

Cattleianum. Strawberry G. To 25 ft., the bark smooth: lvs. to 3 in. long, glabrous: fls. 1 in. across, solitary: fr. purplish-red, to 1½ in. long, with white flesh. Brazil. Var. **lucidum** has sulfur-yellow frs.

chinense: an unidentified hort. name.

Friedrichsthalianum. Costa Rican G. To 25 ft., the branchlets 4-angled: lvs. to 3 in. long, glossy above, pubescent below: fls. 1 in. across, solitary: fr. sulfur-yellow, to 2½ in. long, with white flesh. Cent. Amer.

Guajava. Common G. To 30 ft., with scaly bark and 4-angled branchlets: lvs. to 6 in. long, pubescent beneath, the veins prominent: fls. 1 in. across, solitary or few together: fr. yellow, to 4 in. long, with white, yellow or pink flesh. Trop. Amer.

guineense (*P. Araca*). Brazilian G. Shrub: lvs. to 5 in. long, pubescent below: fls. 2–3 together: fr. greenish-yellow, 1½ in. long, with white flesh. S. Amer. but once supposed to be Guinean (African).—The plants known to the trade under this name are usually forms of *P. Guajava.*

PSILOSTEMON: *Trachystemon.*

PSOPHOCARPUS. *Leguminosæ.* Twining herbs with tuberous roots, lvs. of 3 lfts., papilionaceous fls. in racemes, and 4-angled winged pods; one species grown in warm regions for the edible roots and pods.

tetragonolobus. Goa Bean. Asparagus-Pea. Ann.: lfts. ovate, to 6 in. long: fls. bright blue, 1¼ in. long: pods to 9 in. long, with jagged wings. India.

PSORALEA. Scurfy-Pea. *Leguminosæ.* Strongly scented herbs or shrubs with pellucid dots, usually pinnate lvs., papilionaceous fls. in racemes or spikes, and short 1-seeded pods; one species has an edible root and others may be grown for ornament. Propagated by division.

aphylla. Tall shrub with rod-like branches usually leafless and bearing subulate scales: lfts. (when present) 1–3, narrow-linear: fls. pale blue. S. Afr.

bituminosa. Per. to 3 ft.: lfts. 3, ovate: fls. in dense heads, in spring and early summer. Arabia.

cuspidata. To 2 ft., with tuberous roots: lfts. 5, oval: fls. bluish, in dense oblong spikes, May–June. S. D. to Tex.

esculenta (*Pediomelum esculentum*). Pomme Blanche. Indian Breadroot. Per. to 1½ ft., with edible tuberous root: lfts. 5, obovate: fls. bluish, in dense head-like spikes, May–July. Sask. to Mont.

glandulosa. Shrubby, to 5 ft.: lfts. 3, ovate-lanceolate: fls. blue and white, in racemes. Chile, Peru.

hypogæa. Nearly stemless, with tuberous roots: lfts. 5, linear or oblanceolate: fls. blue, in dense spikes, May–June. Neb. to New Mex.

macrostachya. Leather-Root. Per. to 10 ft.: lfts. ovate: fls. purple, in broad spikes. Calif.

pinnata. Shrub to 12 ft.: lfts. 7–11, linear or linear-lanceolate: fls. blue and white, solitary or clustered. S. Afr.

PSYCHOTRIA. Wild-Coffee. *Rubiaceæ.* Trop. shrubs or trees with mostly opposite lvs., white, yellow or rose somewhat Ixora-like fls. in corymbs, having short tube and 4–6-lobed limb, and fr. a drupe; rarely planted in extreme S. U. S., and sometimes seen under glass.

bacteriophila. Shrub to 10 ft.: lvs. elliptic or ovate-oblong, to 3 in. long, shining above, fleshy: fls. greenish-white, about ⅛ in. long, stamens exserted: fr. reddish, ¼ in. across. Comoro Isls.

capensis. Evergreen: lvs. obovate, to 5 in. long, shining: fls. yellow, ¼ in. long: fr. black, shining. S. Afr.

jasminiflora. Evergreen shrub with white bark: lvs. oblong-ovate, to 3 in. long, pale beneath: fls. white, to 1¼ in. long, stamens exserted. Brazil.

Sulzneri. Shrub: lvs. oblong to elliptic-lanceolate, to 6 in. long, pubescent beneath: fls. white. Fla.

undata. Similar to *P. Sulzneri* but glabrous and corolla-lobes shorter rather than as long as tube. Fla., W. Indies.

PTELEA. Hop-Tree. *Rutaceæ.* N. American small trees or shrubs with usually alternate trifoliolate lvs., small greenish-white polygamous fls. in short dense clusters, and fr. an orbicular or oblong or cordate samara.

Hop-trees thrive in somewhat shady positions in porous soil and are hardy North. Propagated by seeds sown in autumn, budding in summer, layering or grafting in spring under glass. They are ornamental tree-like shrubs of secondary importance. The species are confused, and several kinds are native in United States.

trifoliata. Shrub or tree to 25 ft.: lfts. to 5 in. long: fr. circular, about 1 in. across, dry, winged all around. N. Y. to Fla. and west. Var. **aurea** has yellow lvs.

PTERETIS (*Matteuccia*). Ostrich-Fern. *Polypodiaceæ.* Coarse ferns of N. Amer., Eu. and Asia, 3 species, the sterile lvs. deeply 2-pinnatifid and borne in a circle surrounding the fertile lvs. which have segms. contracted into pod-like bodies around the sori. The American and European plants have been regarded until recently as a single species, and the synonyms properly belonging to *P. Struthiopteris* may be applied in lists to *P. nodulosa.* They are bold strong subjects for outdoor planting. See *Ferns.*

nodulosa (*Onoclea nodulosa*). Lvs. 6–10 ft. long, margins of segms. often revolute, on stalks to 14 in. long. N. S. to Va. and Ia.

Struthiopteris (*Matteuccia* and *Onoclea Struthiopteris. Struthiopteris germanica*). Differs from *P. nodulosa* in less erect habit, shorter lvs. 3–5 ft. long, on stalks to 5 in. long. Eu.

PTERIDIUM. Bracken. Brake. *Polypodiaceæ.* Large coarse ferns with triangular 3–4-pinnate lvs.; sori borne in a marginal line, with double indusium. Useful as background in the rock-garden or wherever large masses of ferns are desired; hardy and durable.

aquilinum (*Pteris aquilina*). Lvs. to 4 ft. long and 3 ft. wide, 3-pinnate into oblong or lanceolate segms., glabrous or pubescent, on stalks to 3 ft. long. Cosmopolitan; practically all over N. Amer. in some of its forms.

PTERIS. Brake. *Polypodiaceæ.* A large group of mostly trop. ferns (omitting Pteridium), a few of which are used for table decoration in fern-dishes, in the window-garden and in conservatories: lvs. 1–4-pinnate; sori in a marginal line with indusia formed of the revolute edge of lf. *P. cretica* and *P. serrulata* and their many forms are well-known subjects for pans and fern-dishes, used in table decorations, and of easy management. See *Ferns.*

adiantoides: *Pellæa viridis.*

Alexandræ: hort. form of *P. cretica.*

aquilina: *Pteridium aquilinum.*

Charlesworthii: hort. var of *P. serrulata.*

Childsii: a modified form of *P. cretica.*

crenata: *P. ensiformis.*

cretica. Lvs. to 1 ft. long, on slender straw-colored stalks, 1-pinnate, segms. to ¼ in. across, the lower often pinnatifid. Tropics and subtropics. Var. **albo-lineata** has lvs. white along center. Cristate, divided or larger forms are vars. *cristata, magnifica, major, nobilis.*

Drinkwaterii: hort. form of *P. cretica.*

Dutrei: modified form of *P. cretica.*

ensiformis (*P. crenata*). SWORD B. Very slender: fertile lvs. erect, to 20 in. long, 1-pinnate, segms. to ¼ in. across; sterile lvs. shorter, segms. to ¾ in. long. E. Asia, Malaya, Australia. Var. **Victoriæ** (*P. Victoriæ*) has segms. banded with white.

Gautherii: hort. form of *P. cretica.*

heterophylla: *Anopteris hexagona.*

longifolia. Lvs. to 2½ ft. long and 1 ft. wide, 1-pinnate, segms. to 6 in. long and ⅓ in. wide, the fertile narrower. Tropics. Var. **Mariesii** has shorter lvs.

marginata: *P. tripartita.*

Mayii: hort. form of *P. cretica.*

multifida: *P. serrulata.*

Ouvardii: hort. form of *P. serrulata.*

quadriaurita. Rather coarse: lvs. to 3 ft. long and 1½ ft. wide, 2-pinnate or lower 3-pinnate, segms. ¼ in. across, entire. Tropics. Usually grown in the var. **argyræa** with segms. banded with whitish. Var. **tricolor** has whitish and reddish bands.

Rivertoniana: a modified form of *P. cretica.*

serrulata (*P. multifida*). Slender: lvs. to 1½ ft. long and 10 in. wide, 1-pinnate into very narrow long segms., lower segms. 2–3-forked, rachis winged. China, Japan. There are many crested and other vars. as *angustata, corymbifera, cristata, nana, variegata, voluta.*

Sieboldii: hort. form of *P. ensiformis.*

tremula. AUSTRALIAN B. Lvs. bright green, to 3 ft. long and 2 ft. wide, 2–4-pinnate, segms. linear, to 1½ in. long, wavy-toothed. New Zeal., Australia.

tripartita (*P. marginata*). Lvs. 3-parted, each branch pinnate, segms. oblong, to 1 in. long, rachis winged. Trop. Asia, Afr., Australia, Pacific Isls.

umbrosa. Lvs. to 3 ft. long, 1-pinnate or lower 2-pinnate, segms. linear-lanceolate, to 6 in. long, entire or sterile toothed. Australia.

Victoriæ: *P. ensiformis* var.

Wilsonii: hort. form of *P. cretica.*

Wimsettii: a cristate form of *P. cretica.*

PTEROCARYA. WING-NUT. *Juglandaceæ.* Asian deciduous monœcious trees with alternate pinnate lvs., unisexual fls. in drooping catkins, and fr. a winged nutlet. Of rapid growth, but some of them require protection in the N. when young. Propagated by seeds, layers or suckers.

caucasica: *P. fraxinifolia.*

fraxinifolia (*P. caucasica*). CAUCASIAN W. To 100 ft.: lvs. of 11–20 ovate-oblong or oblong-lanceolate lfts. to 5 in. long: fr. with nearly orbicular wings, in racemes to 1½ ft. long. Caucasus to Persia.

japonica: *P. stenoptera.*

Rehderiana. Hybrid between *P. fraxinifolia* and *P. stenoptera.*

rhoifolia. To 100 ft.: lvs. of 11–21 ovate-oblong lfts. to 5 in. long: fr. with wing broader than long, in racemes to 1 ft. long. Japan.

sinensis: *P. stenoptera.*

stenoptera (*P. japonica. P. sinensis*). To 100 ft.: lvs. with a winged rachis, of 11–23 oblong lfts. to 4 in. or more long: fr. with oblong wings, in racemes to 1 ft. long. China.

PTEROCEPHALUS. *Dipsaceæ.* Ann. and per. herbs, sometimes subshrubs, in the Medit. region and eastward, differing from Scabiosa in the calyx being represented in fr. by pappus-like awns.

Parnassi (*Scabiosa pterocephala*). Spreading deep-rooted per. 3 or 4 in. high but making broad patches: lvs. more or less lyrate-pinnatifid, to 1½ in. long, scalloped, densely pubescent: fls. purplish-pink, in composite-like heads about 1 in. across standing above foliage. Mts. of Greece.

PTEROSPERMUM. *Sterculiaceæ.* Trees or shrubs of trop. Asia, the growing parts scaly or tomentose, having alternate leathery lvs., large fls., and large leathery or woody capsular frs. One species is planted sparingly in Fla. and probably elsewhere. Propagated by cuttings of the side shoots.

acerifolium. Large tree: lvs. peltate, palmately nerved and usually lobed, to 1 ft. across, thick rusty-pubescent beneath: fls. white, fragrant, to 6 in. across: caps. to 6 in. long. India to Java.

PTEROSTYRAX. EPAULETTE-TREE. *Styracaceæ.* Deciduous trees or shrubs native in Asia, with alternate toothed lvs., white fls. in panicles, and fr. a small ribbed or winged drupe. These plants thrive in rather moist sandy loam. Propagated by seeds, layers, and cuttings of young wood under glass.

corymbosa. Shrub or tree: lvs. oval or ovate, to 5 in. long: fls. in corymbose panicles to 5 in. long: fr. 5-winged, tomentose. Japan, China.

hispida (*Halesia hispida*). To 50 ft.: lvs. oblong, to 7 in. long: fls. fragrant, in drooping panicles to 10 in. long: fr. 10-ribbed, densely bristly. China, Japan; hardy N.

PTERYGOTA. *Sterculiaceæ.* Indian trees differing from Sterculia and Brachychiton chiefly in the winged seeds; one species intro. in Calif.

alata (*Sterculia alata*). Large tree with ash-colored bark: lvs. clustered at ends of branches, cordate-ovate, to 10 in. long and 7 in. wide: fls. unisexual or bisexual, 1 in. across, rusty-tomentose, in few-fld. racemes: fr. a woody pubescent globose follicle to 5 in. across; seed with large corky wing.

PTYCHORAPHIS. *Palmaceæ.* A few Malayan and Philippine unarmed monœcious feather-palms of which one has been planted in Fla.: trunks ringed, usually slender: spadix below the lvs., branched; fls. spirally arranged, pistillate between 2 staminate and all staminate toward the top of the branches; stamens 6: fr. small, ovoid, drupe-like, 1 in. or less long. See *Palm.*

singaporensis (*Drymophlœus* and *Ptychosperma singaporensis*). St. to 12 ft. and only 1½ in. thick: lvs. 3–6 ft. long; pinnæ many, about 8 in. long and 1½ in. broad, the midrib scaly underneath; petiole long and slender and brown-tomentose: fr. about ⅔ in. long.

PTYCHOSPERMA. *Palmaceæ.* Perhaps a dozen to 20 species of ringed unarmed monœcious feather-palms in Malaya, New Guinea and other isls., Australia: lvs. mostly gracefully curved; pinnæ mostly broadened at the apex and toothed or jagged: spadices below the lvs., branched; fls. spirally disposed in 3's, the outer ones staminate; stamens 20–30: fr. small, ovoid or ellipsoid, sometimes beaked, 1-seeded, stigmatic point terminal; seed sulcate or furrowed; albumen ruminate. See *Palm* for cult.

Alexandræ: *Archontophœnix Alexandræ.*

Cunninghamiana: *Archontophœnix Cunninghamiana.*

elegans. Slender palm with solitary trunk to 20 ft., and relatively few lvs. 3 ft. and more long, bright green and paler underneath; pinnæ to 2 ft. long and 1½–3 in. broad, contracted at base, oblique or truncate and toothed or jagged at apex: spadix about 20 in. long, on a very short peduncle; staminate fl.-buds oblong: fr. about ¾ in. long. E. Australia (Queensland); to be expected in S. Fla.—This plant is probably the true *Seaforthia elegans*, but the palm known to planters under that name is *Archontophœnix Alexandræ.*

Macarthuri: *Actinophlœus Macarthuri.*

Normanbyi: *Normanbya Normanbyi.*

Seemannii: *Balaka Seemannii.*

singaporensis: *Ptychoraphis singaporensis.*

PUBERULENT: somewhat or minutely pubescent.

PUBESCENT: covered with short soft hairs; downy.

PUCCOON: *Lithospermum canescens.*

PUDDING-PIPE-TREE: *Cassia Fistula.*

PUERARIA. *Leguminosæ.* Herbaceous or woody twiners with trifoliolate lvs., blue or purple papilionaceous fls. in axillary racemes, and linear more or less flattened pods; native in Asia and Pacific Isls.

The roots of many species yield economic and medicinal products. One species is grown for ornament and is hardy in mid-northern United States, although the vine may be killed back to the ground each winter and may not reach blooming stage. Propagated by root-division, seeds, or cuttings.

hirsuta: *P. Thunbergiana.*

Thunbergiana (*P. hirsuta. Dolichos japonicus*). KUDZU-VINE. Hairy vine to 60 ft.: lfts. broadly ovate, entire or with shallow lobes: fls. purple, fragrant, in late summer: pods hairy. China, Japan.

PUKA: *Meryta Sinclairii.*

PULICARIA. *Compositæ.* Old World herbs with alternate lvs. and yellow heads of ray- and disk-fls. solitary or clustered; pappus of scales and bristles. Plants of somewhat weedy aspect, sometimes planted for ornament and interest.

dysenterica (*Inula dysenterica*). Per. to 2 ft., gray-tomentose: lvs. oblong-cordate, wavy-margined, clasping: heads 1 in. across. Medit. region.

odora (*Inula odora*). Per. to 2 ft., gray-hairy to hoary: lvs. oval or oblong, entire, the upper clasping: heads 2–4, to 1 in. across. Medit. region.

PULMONARIA. LUNGWORT. *Boraginaceæ.* Per. European more or less pubescent herbs with long-stalked basal sometimes mottled lvs., few alternate st.-lvs. and blue or purplish fls. in terminal cymes; corolla funnelform, the throat hairy or naked, stamens included; allied to Myosotis. Suitable for the flower-garden and border. Of easy cult. Propagated by division.

angustifolia. To 1 ft.: lvs. oblong to linear-lanceolate: fls. blue. Eu. Vars. **aurea** and **azurea** are listed.

arvernensis is a hort. form with purple-blue fls.

maculata: *P. officinalis.*

mollis: *P. montana.*

montana (*P. mollis. P. rubra*). To 1½ ft.: lvs. broadly elliptic-lanceolate: fls. violet. Cent. Eu.

officinalis (*P. maculata*). To 1 ft.: lvs. ovate-oblong to linear, spotted with white: fls. red fading to violet. Eu.

rubra: *P. montana.*

saccharata. BETHLEHEM-SAGE. To 1½ ft.: lvs. oval to ovate-oblong, spotted with white: fls. whitish or reddish-violet. Eu.

PULSATILLA: *Anemone.*

PULTENÆA. *Leguminosæ.* Australian shrubs with simple prevailingly alternate lvs., yellow, orange or tinged purple papilionaceous fls. solitary or in terminal heads, and ovate pods; intro. in Calif. Propagated by seeds or cuttings of the tips of shoots.

daphnoides. To 6 ft.: lvs. oblong, to 1½ in. long, pale beneath: fls. in dense sessile heads surrounded by an involucre of lvs.: pods flat, ¼ in. long.

PUMMELO: *Citrus maxima;* see *Citrus Fruits* (page 156).

PUMPKIN and **SQUASH.** Terms employed popularly to designate the edible fruits of *Cucurbita Pepo, C. moschata, C. maxima.* See *Cucurbita, Squash.* The words are not applied with precision, and it is important to accord them more definite meaning. The term *pumpkin* is sometimes applied, in a classificatory way, to the fruits and plants of both *C. Pepo* and *C. moschata*, and *squash* reserved to *C. maxima.* Of *C. Pepo*, there are three well-marked classes: the common running field or pie and stock-feed pumpkins, and the vegetable marrows; the summer and early autumn bush varieties, as the various scallops, pattypans and cymlins, the crooknecks, and certain other forms as the Cocozelle, all of which are commonly known as squashes; the hard-shelled yellow-flowered gourds grown for ornament. *Cucurbita moschata* yields the winter (not warty) crooknecks, the Cushaws, Japanese Pie, Tennessee Sweet Potato, Cheese, and many forms grown in the tropics. Examples of squashes, *C. maxima*, are Marblehead, Plymouth Rock, Bay State, Warren, Delicious, Essex, Mammoth, Hubbard, and the turbans. The three species remain distinct in the field. See *Gourd.*

All the pumpkins and squashes are similar in their cultural requirements. They are sappy rapid-growing frost-tender annuals, requiring rather light quick soil and sunny exposure. Seeds are commonly planted directly where the plants are to stand, although they may be started indoors, if desired, in pots, berry-boxes or knock-down boxes or on inverted sods for they may not transplant very readily otherwise. The running kinds need plenty of room, the hills or stands 8–12 feet apart either way if possible. The bush squashes should be 4 or 5 feet apart if land is available. If the land is not in good heart, well-rotted manure may be forked into the hills, and chemical fertilizer added. The plants should make good headway early, in the northern states, to insure a crop before frost.

In garden operations the squash-bug or stink-bug may be killed by trapping them under boards laid about the vines. Aphis is controlled by spraying with nicotine and fish-oil soap. Striped cucumber beetles are driven away or poisoned by bordeaux mixture with arsenate of lead as well as by nicotine dust; this beetle is the carrier of bacterial wilt.

The fruits of the summer bush varieties, as the scallops and warty crooknecks, are eaten when immature, but other kinds are used when ripe. The squashes and some of the pumpkins can be kept in winter if mature and not injured in handling, in a fairly warm and dryish store-room.

PUNCTATE: with translucent or colored dots or depressions or pits, as in leaves.

PUNGENT: ending in a stiff sharp point or tip; also acrid (to the taste).

PUNICA. *Punicaceæ.* Two trees or shrubs in S. Eu. and Asia, one widely grown for the edible frs. and as an ornamental. **P. Granatum.** Pomegranate. To 20 ft. and more: lvs. lanceolate to oblong, to 3 in. long, shining: fls. orange-red, to 1½ in. across, solitary or clustered toward ends of branchlets: fr. brownish-yellow to red, about size of orange, with hard rind and many seeds and reddish juicy pulp and persistent calyx. S. Asia, widely nat. Var. **nana** is a dwarf form grown in greenhouses and about yards far S. There are double-fld. races and color variations, as vars. **alba, rubra, variegata,** and **Legrellei** with double fls. striped with red and yellow outside.—The pomegranate is adapted to trop. and subtrop. climates and succeeds on deep rather heavy loam. For orchards, bushes should be set 12–18 ft. apart and for hedges 6–8 ft. Propagated mostly by hardwood cuttings in spring, also by seeds and layers.

PUNICACEÆ. Pomegranate Family. Only 1 genus, Punica, and two species, characterized by mostly opposite simple lvs., bisexual fls. having 5–7 sepals and petals, numerous stamens, inferior many-celled ovary, and fr. a hard-shelled berry.

PUNK-TREE: *Melaleuca Leucadendra.*

PURPLE WREATH: *Petrea volubilis.*

PURSHIA (*Kunzia*). Antelope-Brush. *Rosaceæ.* W. American cragged bushes of 1 or 2 species, sometimes transferred to grounds: lvs. small, stiff and clustered, simple: fls. small, yellowish, not showy. **P. tridentata** is a gray or silvery deciduous shrub to 6 ft. or more: lvs. ¼–¾ in. long, linear toward base but broadened and 3-toothed at apex: petals thin, less than ½ in. long. Arid lands, Rocky Mts., Ore., Calif. Var. **glandulosa,** separated as a species by some authors, is more or less evergreen and the lvs. punctate-glandular.

PURSLANE: *Portulaca.* Winter: *Montia perfoliata.*

PUSCHKINIA. *Liliaceæ.* Two spring-blooming bulbous herbs from Asia Minor, one sometimes grown in rock-gardens or borders. For cult. see *Scilla.*

scilloides. To 1 ft.: lvs. basal, to 1 ft. long and 1 in. wide: fls. bluish, ½ in. long, in racemes terminating the scape, the perianth-segms. partially united. Var. **libanotica** has longer perianth-lobes.

PUSSLEY: *Portulaca oleracea.*

PUSSYS-TOES: *Antennaria.*

PUTTY-ROOT: *Aplectrum.*

PUYA. *Bromeliaceæ.* Terrestrial stiff mostly giant herbs native in dry parts of S. Amer., having spiny-margined lvs. in dense rosettes and blue, purple or yellow fls. in spikes or racemes; planted occasionally in the hothouse. Cult. as for *Bromelia;* out-of-doors in Calif. They thrive without special treatment.

alpestris. Sts. short: lvs. to 2 ft. long and 1 in. wide, pale beneath: fls. dull metallic blue, 1½ in. long, anthers bright orange, the infl. much branched. Chile.

cærulea. To 4 ft.: lvs. 2 ft. long, narrow: fls. blue, the infl. somewhat branched. Chile.

chilensis (*Pourretia chilensis*). To 5 ft.: lvs. to 4 ft. long, very narrow, glaucous: fls. greenish-yellow, in a branching infl. Chile.

PYCNANTHEMUM (*Koellia*). Mountain-Mint. *Labiatæ.* Per. herbs with opposite entire lvs. and small white or purplish fls. in heads or cymes in late summer or fall; native of N. Amer. and sometimes transplanted. Of easy cult.

flexuosum. To 2½ ft.: lvs. to 2 in. long and 1/12 in. wide: fls. in dense heads ½ in. across. Me. to Fla. and Tex.

incanum. To 3 ft.: lvs. to 3 in. long and 1½ in. wide, white-pubescent beneath: fls. in loose clusters to 1½ in. across. Me. to Fla. and Mo.

lanceolatum: *P. virginianum.*

virginianum (*P. lanceolatum*). To 3 ft.: lvs. to 2 in. long and ⅓ in. wide, fragrant: fls. in dense heads ½ in. across. Que. to Ga. and Ala.

PYCNOSTACHYS. *Labiatæ.* African per. herbs with opposite lvs. and blue or violet 2-lipped fls. in whorls in dense terminal spikes; one species grown under glass, and in the open far S.

Dawei. To 6 ft.: lvs. lanceolate, to 1 ft. long, toothed, pubescent: fls. cobalt-blue, ¾ in. long, spikes to 5 in. long, calyx-teeth becoming spinescent. Trop. Afr.

PYRACANTHA. Firethorn. *Rosaceæ.* Evergreen usually thorny shrubs with alternate simple lvs., white fls. in corymbs, and fr. a small red or orange pome; native in S. Eu. and Asia.

Firethorns are planted for ornament and hedges. The fruit is showy. *P. coccinea* is fairly hardy in middle states but the other species can be grown only in the South and California. Propagated by seeds, by cuttings of ripe wood under glass, by layers, and rare kinds by grafting on cratægus or cotoneaster.

angustifolia (*Cotoneaster angustifolia*). To 12 ft., the branches often prostrate: lvs. narrow-oblong, to 2 in. long, nearly entire, gray-tomentose beneath: corymbs tomentose. China.

coccinea (*Cotoneaster* and *Cratægus Pyracantha*). To 20 ft.: lvs. oval to oblanceolate, to 1½ in. long, finely toothed, becoming glabrous: corymbs pubescent. S. Eu., W. Asia. Var. **Lalandi** is a more vigorous form with orange-red fr.

crenulata (*Cotoneaster* and *Cratægus crenulata*). To 20 ft.: lvs. oblong to oblanceolate, to 2 in. long, wavy-toothed, glabrous, shining above: corymbs glabrous.

Himalayas. Var. Rogersiana is lower, with oblanceolate lvs.

formosana: *P. Koidzumii.*

Gibbsii. To 10 ft., often spineless: lvs. obovate-oblong, to 3 in. long, wavy-toothed or entire, glabrous, shining above: corymbs glabrous. China. Var. **yunnanensis** (*P. yunnanensis. P. crenulata* var. *yunnanensis*) has usually obtuse lvs.

Koidzumii (*P. formosana*). Lvs. clustered at tips of branchlets, oblong-obovate, 1 in. long, entire, pale and pubescent beneath: corymbs nearly glabrous. Formosa.

yunnanensis: *P. Gibbsii* var.

PYRENOGLYPHIS: *Bactris major.*

PYRETHRUM. *Compositæ.* An old genus modernly combined with Chrysanthemum. The florists pyrethrum is *Chrysanthemum coccineum* (*C. roseum*); it is a spring- or early summer-blooming per. with long erect sts. bearing a large brilliant crimson, lilac or white head and finely cut lvs. Another plant still known in gardens as pyrethrum is the feverfew, *C. Parthenium;* and *C. uliginosum* is also sometimes named in that genus. *P. inodorum* is *Matricaria inodora; P. Tchihatchewii* is a Matricaria.

PYRIFORM: pear-formed or -shaped.

PYROLA. Shinleaf. *Pyrolaceæ* or *Ericaceæ.* Per. herbs having rootstocks, clusters of evergreen lvs. and white, greenish or purplish fls. in racemes terminating a scape, in summer: sometimes transplanted to the wild-garden or colonized in woods but they do not thrive in usual garden soil. Sometimes called wintergreen: see *Gaultheria.*

americana. To 1 ft.: lvs. orbicular, to 3 in. long, thick: fls. white. N. S. to N. C. and Ky.

bracteata: *P. rotundifolia.*

chlorantha. To 8 in.: lvs. orbicular, to 1¼ in. long: fls. greenish-white. N. Amer., Eu.

elliptica. To 10 in.: lvs. oval, to 3 in. long: fls. white. N. Amer.

rotundifolia (*P. bracteata*). To 1 ft.: lvs. nearly round, to 2 in. long: fls. white. Eu.

secunda. To 10 in.: lvs. ovate to nearly orbicular, to 2 in. long: fls. white or greenish-white. N. Amer.

uniflora: *Moneses uniflora.*

PYROLACEÆ (sometimes written *Pirolaceæ*). Shinleaf Family. Low mostly evergreen herbaceous or scarcely woody plants of northern regions, sometimes included in Ericaceæ. Three genera are characteristic of the family, Pyrola, Chimaphila, Moneses; these are plants with small nearly regular bisexual fls. in which the corolla is comprised of separate petals. Some authors include the saprophytic genera, like Monotropa, Pterospora and Sarcodes in this family, others separate them in the family Monotropaceæ and still others retain them in Ericaceæ; they are not cultivated plants but Monotropa (which see) is sometimes planted.

PYROSTEGIA. *Bignoniaceæ.* A few S. American woody evergreen climbers with lvs. of 2–3 lfts. and 3-parted tendrils, tubular fls. in terminal panicles, the stamens exserted, and long linear frs.; commonly planted as an arbor and roof vine in S. U. S., making a brilliant display when in bloom; sometimes grown in conservatories. Propagated by cuttings.

ignea (*P.* and *Bignonia venusta*). Lfts. ovate, to 3 in. long: fls. reddish-orange, to 3 in. long, with reflexed lobes margined with white hairs: fr. to 1 ft. long. Brazil.

venusta: *P. ignea.*

PYRUS. Pear. Apple. *Rosaceæ.* Trees or large bushes, deciduous or nearly so, native in the northern hemisphere, some of them planted as orchard fruits and many others for ornament and some of them grown for stock and for experimental purposes: lvs. simple and alternate, sometimes deeply lobed: fls. showy, mostly in advance of full leafage, regular and typically bisexual: fr. a pome, formed by the coalescence of ovary and hollowed torus (or calyx-tube), fleshy, often edible. See *Malus*, the generic name employed by some writers for the apple. When no synonymy is given in Malus it is indication that the plant belongs to the pear section of the genus.

The pyruses are hardy plants of simple culture. They propagate readily from seeds sown in autumn or preferably properly kept (without hardening and much drying) until spring. On these stocks the named horticultural varieties of the same or similar species are budded or grafted. The oriental or "flowering" crab-apples are among the choicest ornamentals both for charming spring bloom and attractive fruit. See *Apple, Pear.*

americana: *Sorbus americana.*

amygdaliformis. Almond Pear. Shrub or tree to 20 ft. or more, grown for ornament in differing forms: lvs. thick, oblong to narrow-obovate, entire or nearly so, glaucescent and becoming nearly or quite glabrous underneath: fls. about 1 in. across, white: fr. 1 in. more or less diam., yellowish-green and hard. France to Asia Minor. Var. **persica** (*P. persica. P. sinaica*). Lvs. oblong and fr. depressed endwise.

angustifolia (*Malus angustifolia*). Southern Crab-Apple. To 25 ft., partially evergreen: lvs. lance-oblong to narrow-obovate, closely serrate or entire, glabrous or sometimes slightly pubescent on veins underneath: fls. about 1 in. across, pink or rose, fragrant: fr. 1 in. or less diam., depressed both ends. Va. to Fla. and Miss.

arbutifolia: *Aronia arbutifolia.*

Aria: *Sorbus Aria.*

Arnoldiana: *P. floribunda* var.

astracanica: *P. Malus* var.

atropurpurea: *Aronia atropurpurea.*

atrosanguinea (*P. floribunda* and *P. pulcherrima* var. *atrosanguinea. Malus atrosanguinea*). Carmine Crab-Apple. Handsome bush like *P. floribunda* but fls. of deeper rose not fading white, the lvs. shining and more glabrous and those on young shoots sometimes slightly lobed. Supposed to be hybrid of *P. Halliana* and *P. Sieboldii.*

Aucuparia: *Sorbus Aucuparia.*

auricularis: *Sorbopyrus auricularis.*

baccata (*Malus baccata*). Siberian Crab-Apple. Glabrous tree to 40 ft., with hard wiry branchlets: lvs. oval to ovate-lanceolate, with callous serratures, long-petioled: fls. about ½ in. across, white, on slender pedicels: fr. ¾ in. or less diam., wax-like, yellow or red, calyx-lobes falling. Siberia, Manchuria, China.—Has supposedly entered into a number of hybrids. Var. **mandshurica** (*P. cerasifera* in part) has pubescent calyx, pedicels and petioles, lvs. remotely serrulate, frs. mostly larger. Var. **Jackii** is like var. *mandshurica* but glabrous, fr. red.

betulæfolia. Tree to 20 ft. or more, branchlets tomentose: lvs. mostly ovate-acuminate, sharp-serrate, shining above and tomentose or becoming nearly glabrous underneath: fls. ⅗ in. across, white: fr. about ⅓ in. diam., brown and dotted, calyx-lobes falling. N. China; hardy N.—Free-flowering and suggested as experimental stock for the pear.

Bollwylleriana: *Sorbopyrus auricularis.*

Bretschneideri. One of the oriental pears, distinguished by ovate or elliptic-ovate lvs. with a mostly acuminate base, yellow subglobose fr. about 1 in. long, calyx falling. China; hardy N.

Calleryana. Glabrous tree: lvs. ovate or broader, short-pointed, crenate (not sharp-serrate): fls. 1 in. or less across, white, styles 2 or 3: fr. about ½ in. or less diam., globular, dotted brown. China; hardy N.—Attracts attention as a pear stock. Var. **tomentella** has young branchlets and young lvs. tomentose or floccose, pedicels villous.

cerasifera: *P. baccata* var. *mandshurica*, and *P. prunifolia* var. *robusta.*

communis. PEAR. Large long-lived tree: lvs. oval to oblong-ovate, hard in texture, short-pointed, crenate-serrulate to nearly entire, glabrous or becoming so: fls. 1 in. or more across, white sometimes tinged pink, appearing with first foliage: fr. mostly pyriform, variable, with gritty cells. Eu. and W. Asia.—Cult. as an orchard fr.

coronaria (*Malus coronaria*). GARLAND CRAB-APPLE. WILD SWEET CRAB. Tree to 30 ft., soon becoming glabrous: lvs. ovate to oval, more or less acuminate, green underneath, sharp-serrate and perhaps notched, on shoots somewhat lobed toward apex: fls. 1 in. or less across, rose changing to white: fr. 1 in. diam., oblate, yellowish, hard and sour, long-stemmed. N. Y. and Ont. to Ala. and Mo.—There is a spotted-lvd. and a semi-double form.

cratægifolia: *P. florentina.*

Cydonia: *Cydonia oblonga.*

Dawsoniana (*Malus Dawsoniana*). Small tree, supposedly cross between *P. fusca* and *P. Malus:* lvs. oval to elliptic-oblong, seldom lobed: fls. 1 in. or more across, white, slender-pedicelled, with the lvs.: fr. 1 in. or more diam., yellow. Raised at Arnold Arboretum.

Delavayi: *Docynia Delavayi.*

domestica: *Sorbus domestica.*

elæagrifolia. Small commonly thorny tree tomentose on twigs and both sides or under side of lvs., the latter lanceolate to very narrow-obovate and entire: fls. about 1 in. across, white, on tomentose pedicels: fr. about 1 in. diam., green, short-pedicelled. Asia Minor, Caucasus.

Eleyi (*Malus Eleyi*). Small tree supposed to be a hybrid between *P. Malus* var. *Niedzwetzkyana* and *P. atrosanguinea* and one of the forms included in the name *Malus purpurea:* lvs. elliptic to ovate, pubescent underneath, reddish when opening and with purple rib: fls. light red, 1 in. or more across: fr. purple-red, slender-stalked.

flexilis: a listed name.

florentina (*P. cratægifolia. Malus florentina. Cratægus florentina*). Small close-headed crab-apple with lobed hawthorn-like sharp-toothed lvs. soft-pubescent underneath: fls. ¾ in. across, white, on slender pedicels: fr. about ½ in. long, red. Italy.

floribunda (*P. pulcherrima. Malus floribunda*). SHOWY CRAB-APPLE. Profusely blooming, becoming nearly or quite glabrous, large bush or a tree 25 ft. or more: lvs. ovate to oblong, acuminate, not lobed but sometimes angled on young shoots, sharp-serrate: fls. 1¼ in. or less across, rose-red changing to nearly white: fr. about ⅓ in. diam., red, calyx falling. Probably Japan or China, or perhaps a race of hybrids. Var. **aldenhamensis**: see *P. Malus* var. Var. **Arnoldiana** has larger lvs. and fls., the latter lighter-colored, fr. larger and yellow. Thought to be a hybrid of *P. floribunda* and *P. baccata.* Var. **Scheideckeri**, lvs. ovate, fls. pale pink and commonly semi-double, fr. ¾ in. diam., yellow, calyx usually persistent. Supposed hybrid.

formosana (*Malus formosana*). Tree to 50 ft.: lvs. elongated (to 6 in.), oblong or elliptic-oblong, acute, coarsely serrate, white-tomentose when young: fls. about 1 in. across, the pedicels white-tomentose: fr. to 2 in. diam., apple-like in shape, yellowish-red, the calyx persistent, rather astringent but eaten by natives of Formosa when cooked or pickled. Planted in Calif.

fusca (*P. rivularis. Malus fusca*). OREGON CRAB-APPLE. Tree to 30 ft. or more: lvs. ovate-lanceolate, acute, sharply and perhaps glandular-serrate, pubescent underneath, slightly 3-lobed on young shoots: fls. ¾ in. across, white, with the lvs.: fr. ¾ in. or less long, yellow to reddish. N. Calif. to Alaska.

germanica: *Mespilus germanica.*

glabrata (*Malus glabrata*). A southern representative of *P. glaucescens*, the lvs. not glaucescent, glabrous, deeply lobed, cordate, lowest pair of lateral veins issuing from very base of blade. N. C. to Ala.

glaucescens (*Malus glaucescens*). Small tree or large shrub distinguished from *P. coronaria* by broader lvs. somewhat glaucous underneath and all of them slightly lobed, the calyx somewhat hairy. N. Y. to Ala.

Halliana (*Malus Halliana*). HALL CRAB-APPLE. Attractive essentially glabrous shrub or small tree to 18 ft., with somewhat purplish twigs and other parts: lvs. long-ovate to oblong, acuminate, closely crenate-serrate to entire, glossy above: fls. 1½ in. or less across, deep rose, calyx-lobes nearly obtuse, styles 4 or 5: fr. about ⅓ in. diam., purplish. Probably China; hardy N. Var. **Parkmanii** is double-fld.

heterophylla. Tree to 30 ft. or shrubby, thorny: lvs. various, usually ovate in outline, sometimes with very narrow pinnate lobes, sometimes undivided and crenate-serrulate: fls. about 1 in. across, white: fr. about 1 in. diam., somewhat flattened endwise. Turkestan; hardy N.

ioensis (*Malus ioensis*). PRAIRIE CRAB-APPLE. Tree to 30 ft., tomentose on young parts and mostly on under side of the oblong-ovate, short-acute, serrate and sometimes side-lobed lvs.: fls. 1–2 in. across, white or tinted: fr. about 1 in. long, short-oblong, slender-pedicelled. Ind. to Minn. and Mo.—Bechtel's Crab is a double-fld. form.

japonica: *Chænomeles japonica.*

Kaido: *P. micromalus.*

kansuensis (*Malus kansuensis*). Tree to 25 ft.: lvs. broad-ovate, serrate, 3–5-lobed, 3-nerved at base, more or less pubescent underneath: fls. about ½ in. across, white, styles 3: fr. about ½ in. long, reddish or yellow. China; hardy N.

lancifolia (*Malus lancifolia*). Distinguished from *P. coronaria* by the narrow more acuminate lvs. which are ovate-lanceolate to oblong-lanceolate, and longer narrower calyx-lobes: fr. subglobose, about 1 in. diam., on slender drooping pedicels, green. Pa. and Va. to Mo.

longipes (*P. communis* var. *longipes*). Small tree: lvs. ovate or broader, acute or nearly obtuse, rounded or subcordate at base, becoming glabrous underneath, petiole long: fls. about 1 in. across, white: fr. about ½ in. diam., globose, calyx deciduous. Algeria.

Malus (*Malus sylvestris* and *M. communis*). APPLE. Tree to 40 ft. or more, with young branches and under side of lvs. tomentose or pubescent: lvs. oval or elliptic to broad-ovate, acute or nearly so, becoming smooth and often glossy above, obtusely serrate: fls. usually appearing with first foliage, 2 in. or less across, white and pink: fr. various, without grit cells, on thick pubescent stalks, calyx persistent. Eu., W. Asia. Cult. in many orchard vars. and in double-fld. and other forms. Var. **aldenhamensis** (*P. floribunda* var. *aldenhamensis. Malus purpurea* var. *aldenhamensis*). Small tree with ovate or ovate-oblong lvs. with purple rib and more or less pubescent underneath: fls. partially double, light red: fr. purple-red. Offshoot of *P. Malus* var. *Niedzwetzkyana*, perhaps hybrid with *P. atrosanguinea.* Var. **apetala**, the Bloomless apple, has fls. without good stamens and showy petals, styles 10–15 and ovary more than 5-celled, calyx end of fr. not closed. Var. **astracanica**, supposed to be a hybrid between *P. Malus* and *P. prunifolia*, has sharply and coarsely serrate lvs. and long-stalked fr. Var. **Niedzwetzkyana** has bark and wood reddish, lvs. tinged red on nerves, fls. deep red, fr. purple-red inside and out. Var. **paradisiaca** (*M. pumila*) is the Paradise apple, a self-continuing race of very small stature.—There is no generally accepted Latin name for the apple when it is separated in the genus Malus. The earliest name is undoubtedly *M. sylvestris*, applied to the sour wild or spontaneous apple of Eu., presumably not specifically distinct from the common cult. apples. Probably the earliest name for the cultivated and wild apple together as a class or group is *M. communis.* The duplicate name, *Malus Malus*, is a recent combination and such repetitions are not allowed by the International Rules of Nomenclature, under which horticulturists dealing with world floras preferably work. The name *Malus pumila* is not only inapplicable but was applied by Miller, its author, to the Paradise apple; if the binomial *Malus pumila* is adopted, the species must be defined as a dwarf in terms of the Paradise apple and the common apples be made major or giant forms of it. It is possible that the cultivated apples are not a single original species, but the initial elements are not known and the present forms are blindly confused, so that it is impossible as yet to represent the case exactly in binomial nomenclature.

Maulei: *Chænomeles japonica.*

melanocarpa: *Aronia melanocarpa.*

micromalus (*Malus micromalus. P.* and *M. Kaido*). Kaido Crab-Apple. Small tree allied to *P. spectabilis* but distinguished by narrower lvs. attenuate at base, slender petiole, deeper pink fls. about 1½ in. across, pubescent pedicels and calyx, fr. subglobose and with cavity at base and calyx sometimes falling. Probably a hybrid, with *P. spectabilis* as one parent.

Niedzwetzkyana: *P. Malus* var.

nigra: *Aronia melanocarpa.*

nivalis. Snow Pear. Small tree, white-tomentose on many parts, thornless: lvs. oval to obovate, acute, narrowed to base, entire or essentially so, tomentum remaining on under surface: fls. about 1½ in. across, white: fr. 1–2 in. diam., globose. E. Eu., Asia Minor.—Useful for ornament, and fr. for perry (pear cider).

ovoidea: *P. ussuriensis* var.

Parkmanii: *P. Halliana* var.

Pashia. Tree to 30 ft. or more, usually spiny: lvs. ovate to ovate-lanceolate, acuminate, crenate, becoming nearly or quite glabrous, often lobed and sharp-serrate on shoots: fls. 1 in. across, white: fr. about ¾ in. across, subglobose, brown. Himalaya to China; hardy N.

persica: *P. amydaliformis* var.

phæocarpa. Tree of medium size, most parts becoming glabrous: lvs. elliptic to ovate, long-attenuate, base mostly broad-cuneate, open-serrate: fls. about 1 in. across, white: fr. about 1 in. long, pyriform, brown. N. China; hardy N.

pinnatifida: *Sorbus hybrida.*

platycarpa (*Malus platycarpa*). One of the *P. coronaria* kind of crab-apple, but lvs. broad and large, ovate to elliptic, rounded at base, short-acute, sharp-serrate, glabrous or pubescent on veins underneath, those on vigorous shoots with several pairs of triangular lobes: fls. about 1½ in. across, white: fr. about 2 in. diam., flattened or hollowed at ends. N. C. to Ga.

Pollveria: *Sorbopyrus auricularis.*

Prattii (*Malus Prattii*). Tree to 30 ft.: lvs. ovate to elliptic-lanceolate, acuminate, finely serrate, slightly pubescent on veins underneath: fls. about ¾ in. across, white: fr. about ½ in. long, red or yellow. China; hardy N.

prunifolia (*Malus prunifolia*). Small tree: lvs. ovate to broad-oval, short-acuminate, serrate, pubescent underneath or at length glabrous: fls. about 1½ in. across, white, calyx mostly glabrous and lobes longer than tube: fr. about 1 in. diam., yellow or red, hanging long. Probably N. E. Asia, perhaps a range of hybrids. Var. **Rinki** (*P.* and *M. Ringo*). Ringo Crab-Apple. Lvs. pubescent underneath and fls. pink, calyx somewhat hairy. Var. **robusta** (*M. robusta. P. cerasifera* in part). Probably a hybrid: vigorous plant with large oblong or oblong-ovate lvs. glabrous or pubescent underneath: fls. white or pinkish, on slender stalks: fr. about ¾ in. or less diam., yellow and red.

pulcherrima: *P. floribunda.*

purpurea (*Malus purpurea*). A series of hybrids or offshoots of the *Niedzwetzkyana* race of *P. Malus* with more or less colored lvs. and fls. See *P. Eleyi* and *P. Malus* var. *aldenhamensis.*

pyrifolia (*P. serotina*). Sand Pear. Tree to 50 ft., glabrous or becoming so: lvs. ovate or somewhat longer, long-acuminate, setose-serrate: fls. 1½ in. across, white, with lvs. or just in advance of them, styles 5: fr. mostly apple-shaped, very hard, brown, calyx-lobes falling. China,—Cult. (in var. culta) for its fr. LeConte, Kieffer and other orchard vars. are hybrids with the common pear.

Ringo: *P. prunifolia* var. *Rinki.*

Riversii: *P. spectabilis* var.

rivularis: *P. fusca.*

robusta: *P. prunifolia* var.

salicifolia. Often spiny tree to 30 ft.: lvs. willow-like, ¾ in. or less broad, tapering at both ends, entire, tomentose when young but becoming glabrous: fls. ¾ in. across, white: fr. about 1 in. long, pyriform, yellowish, calyx persistent. Caucasus, Armenia; hardy N.

Sargenti (*Malus Sargentii*). More or less spiny shrub to 6 ft.: lvs. ovate to elliptic-oblong, short-pointed to acuminate, sharply serrate, pubescent at first but becoming nearly glabrous, those on shoots 3-lobed and broader: fls. 1 in. across, clear white: fr. about ½ in. diam., dark red, calyx falling. Japan; hardy N.

Scheideckeri: *P. floribunda* var.

serotina: *P. pyrifolia.*

serrulata. Small tree differing from *P. pyrifolia* by shorter lvs. without setose serratures, smaller fls. with styles 3 or 4, subglobose fr. about ¾ in. long, and calyx persistent or often so. China; hardy N.

Sieboldii (*Malus Sieboldii. P.* and *M. Toringo*). Toringo Crab-Apple. Shrub, or a tree to 15 ft.: lvs. ovate to oblong-ovate, short-acuminate, sharp-serrate, becoming glabrous or nearly so underneath, those on shoots lobed or strongly notched at or below the middle: fls. ¾ in. across, pink to blush: fr. ⅓ in. diam., red or yellowish, calyx falling. Japan; hardy N.—For var. *calocarpa*, see *P. Zumi.*

sinaica: *P. amygdaliformis* var. *persica.*

sinensis: *P. pyrifolia*, the Sand Pear, is mostly meant.

Sorbus: *Sorbus domestica.*

Soulardi (*Malus Soulardi*). Soulard Crab-Apple. Much like the apple-tree: lvs. round-ovate, to oblong-ovate, mostly blunt at apex, coarsely and bluntly toothed, more or less shallowly lobed along sides, densely pubescent underneath: fls. blush, in close clusters of woolly pedicels: fr. 2 in. more or less diam., flattened on ends, yellowish, fairly edible. Natural hybrid, west of Great Lakes, between *P. Malus* and *P. ioensis.*

spectabilis (*Malus spectabilis*). Tree to 25 ft.: lvs. oval to elliptic or oblong, short-pointed, broad or often narrowing at base, crenate-serrate, glossy above and becoming glabrous or nearly so underneath: fls. showy, 2 in. or less across, rose to pink, lobes of calyx not longer than tube: fr. 1 in. or less diam., yellow, without basal cavity, calyx persistent. China, but not known native; hardy N. Var. **Riversii** has large double pink fls. and large lvs.

theifera (*Malus theifera*). Small stiff-branched tree distinguished from *P. Halliana* by larger and broader ovate to elliptic-ovate thinner sharply serrate lvs., white or blush fls., calyx-lobes acute rather than obtusish, styles commonly 3, fr. about ⅓ in. long, pyriform. Himalaya to China; hardy N.

Toringo: *P. Sieboldii.*

toringoides (*P. transitoria* var. *toringoides. Malus toringoides*). Tree to 25 ft. or shrub: lvs. ovate to oblong, serrate, mostly with two pairs of lobes, becoming glabrous underneath except on veins: fls. creamy-white, 1 in. or less across, styles glabrous at base: fr. ½ in. diam., yellow and reddish in sun. China; hardy N.

torminalis: *Sorbus torminalis.*

transcendens. Probably a name for the Transcendent and similar crab-apples, supposed to be hybrids of *P. baccata* and *P. Malus.*

transitoria var.: *P. toringoides.*

trilobata (*Malus trilobata*). Shrub with strongly 3-lobed serrulate lvs. becoming glabrous and also glossy above: fls. more than 1 in. across, white: fr. ¾ in. or less diam., red, calyx persistent. W. Asia; hardy N.—Not to be confounded with var. *trilobata* (a lobed-lvd. form) of *P. communis.*

Tschonoskii (*Malus Tschonoskii*). Erect tree to 30 or 40 ft.: lvs. ovate to elliptic, broad at base, acuminate, coarsely sharp-serrate, remaining pubescent underneath: fls. about 1 in. across, white tinged rose, on stout pubescent pedicels: fr. about 1 in. diam., globose or obovoid, yellow with rosy cheek, calyx persistent. Japan; hardy N.

ussuriensis. Tree: lvs. nearly orbicular to ovate, broad or subcordate at base, acuminate, strongly setose-serrate, nearly or quite glabrous: fls. 1 in. and more across, white, on short pedicels: fr. to 1½ in. diam., nearly globose, greenish-yellow, calyx persistent. N. E. Asia; hardy N., and has been tried experimentally as pear stock. Var. ovoidea (*P. ovoidea*) has ovate to oblong-ovate lvs. and more ovoid long-stemmed frs. N. China and Korea.

Veitchii: *P. yunnanensis* var.

yunnanensis (*Malus yunnanensis*). Tree to 30 ft.: lvs. ovate to oblong, broad at base or subcordate, short-pointed, sharp-serrate, often 3–5-lobed on each side, thick-pubescent underneath: fls. small, about ½ in. across, white, many in a close cluster: fr. about ½ in. diam., nearly globose, red. China; hardy N. Var. **Veitchii** (*P. Veitchii*) has lvs. cordate at base and all more or less lobed and becoming nearly glabrous underneath.

Zumi (*Malus Zumi*). Tree to 20 ft. or more, pyramidal: lvs. oblong to ovate-oblong, acute, crenate to entire or serrate and sometimes somewhat lobed on shoots, becoming glabrous underneath: fls. about 1 in. across, pink in bud but becoming white, the calyx-lobes acuminate: fr. about ½ in. diam., globose, red, calyx falling. Japan; hardy N.—Thought to be hybrid of a form of *P. baccata* and *P. Sieboldii*. Var. **calocarpa** (*P. Sieboldii* var. *calocarpa*), of more spreading habit: lvs. on shoots more deeply lobed: fls. smaller.

PYXIDANTHERA. *Diapensiaceæ.* One creeping evergreen shrub forming cushion-like masses, native in pine-barrens from N. J. to N. C., and sometimes transplanted to the rock-garden and similar places. **P. barbulata.** PYXIE. FLOWERING-MOSS. PINE-BARREN BEAUTY. Branches to 1 ft. long, covered with very small lvs.: fls. white, about ⅛ in. across, solitary but many at ends of branches, Mar.–May.

PYXIE: *Pyxidanthera barbulata.*

Q

QUAIL-BUSH: *Atriplex lentiformis.*

QUAMASIA: *Camassia.*

QUAMOCLIDION: *Mirabilis multiflora.*

QUAMOCLIT. Star-Glory. *Convolvulaceæ.* Herbaceous trop. vines with alternate, simple or compound lvs. and salverform red or yellow fls. in long-stalked axillary clusters, the stamens and style exserted; cult. as for *Ipomœa,* from which it is distinguished by the small slender fls. and protruding stamens and style. Often grown from seed as summer-flowering vines.

coccinea (*Ipomœa coccinea*). Star Ipomœa. Ann. to 10 ft.: lvs. cordate-ovate, to 6 in. long, entire or angular-lobed: fls. scarlet with yellow throat, to 1½ in. long. Trop. Amer.; nat. in N. Amer. Var. **hederifolia** (*Ipomœa hederifolia*) has 3–5-lobed or -parted lvs. Var. **luteola** has yellow or orange fls. 1 in. long.

lobata (*Mina lobata*). Per. to 20 ft.: lvs. cordate, 3 in. across, deeply 3-lobed: fls. crimson becoming pale yellow, with short tube and cylindrical limb ¾ in. long, the stamens long-exserted. Mex.

pennata (*Ipomœa Quamoclit*). Cypress-Vine. Ann. to 20 ft.: lvs. pinnately cut into thread-like segms.: fls. scarlet, to 1½ in. long. Trop. Amer., S. U. S. Var. **alba** has white fls.

Sloteri. Cardinal-Climber. Hybrid between *Q. coccinea* and *Q. pennata:* ann.: lvs. to 4½ in. across, palmately lobed nearly to base into 7–15 segms. to ½ in. across: fls. crimson with white throat, to 2 in. long.

QUASSIA. *Simaroubaceæ.* Trees with bitter white wood having medicinal properties, and sometimes grown for ornament in the tropics: lvs. pinnate: fls. diœcious, in terminal racemes or panicles: fr. of 5 spreading drupes. One species is sometimes planted in the warmest parts of the country for interest, it being a medicinal plant with a bitter principle; also worth growing for ornament.

amara. To 10 ft. and more: lvs. of 5 elliptic-oblong lfts., the petioles winged: fls. crimson, to 1½ in. long, in racemes. Trop. Amer.

QUEEN-OF-THE-MEADOW: *Filipendula Ulmaria.* **-of-the-Prairie:** *Filipendula rubra.*

QUEENSLAND NUT: *Macadamia ternifolia.*

QUERCUS. Oak. *Fagaceæ.* Mostly northern hemisphere hardwood trees and bushes with alternate lvs., staminate fls. in slender drooping catkins, pistillate in 1-many-fld. spikes, and nut or acorn inclosed or surrounded at base by a cup-like involucre; grown for ornament and timber, commonly with striking colors in autumn. The acorns are employed as feed for hogs and the bark of some species yields medicinal products, cork and tanning materials; major trees in hort. literature.

Oaks thrive on rich rather moist soil for the most part, although the scrub oaks inhabit dry barren lands. Most of the deciduous species are hardy North, while the evergreen kinds are adapted only to the southern and warmer parts of the country. Propagated by seeds sown in autumn or stratified and the evergreen species also by cuttings and layers; protect the seed-acorns from vermin. Varieties may be grafted on seedling stocks under glass in early spring or sometimes in August.

acuta. Japanese Evergreen O. Small tree: lvs. evergreen, oblong, to 5 in. long, entire and wavy-margined: cup pubescent, about ¼ length of nut. Japan.

acutissima. To 50 ft.: lvs. deciduous, oblong, to 7 in. long, with bristle-like teeth, shining above: cup with spreading scales, ⅔ length of nut. Asia.—Formerly known as *Q. serrata* but this name properly belongs to another species.

Ægilops (*Q. ventricosa*). To 80 ft.: lvs. deciduous, elliptic to oblong, to 4 in. long, with 9–13 entire bristle-tipped lobes, yellowish-tomentose beneath: cup ⅓–½ length of nut. S. Eu., W. Asia.

agrifolia. California Live O. To 100 ft.: lvs. evergreen, elliptic, to 3 in. long, spiny-toothed, light green and glossy beneath: cup pubescent, ¼–⅓ length of nut. Calif.

alba (*Q. ramosa*). White O. To 100 ft.: lvs. deciduous, obovate, to 9 in. long, with 5–9 entire obtuse lobes, glaucescent beneath: cup about ¼ length of nut. Me. to Fla. and Tex. Var. **repanda** has lvs. with shallow sinuses.

aliena. Oriental White O. To 70 ft.: lvs. deciduous, oblong-obovate, to 8 in. long, coarsely toothed, gray-tomentose beneath: cup gray-tomentose, about ⅓ length of nut. Japan, Korea, China.

ambigua: *Q. borealis.*

aquatica: *Q. nigra.*

arkansana. Like *Q. marilandica* but lvs. pale underneath, and the scales on cup of acorn erect and in a single row: lvs. deciduous, broad-obovate, broad at apex, little if at all lobed, to 4 or 5 in. long: cup shallow and flat. Ark.

Ballota: *Q. Ilex* var. *rotundifolia.*

bicolor. Swamp White O. To 70 ft.: lvs. deciduous, obovate, to 6 in. long, coarsely toothed or lobed, dark green above, whitish-tomentose beneath: cup about ⅓ length of nut. Que. to Ga. and Ark.

borealis (*Q. ambigua. Q. rubra* var. *ambigua*). Northern Red O. To 80 ft.: lvs. deciduous, oblong, to 9 in. long, 7–11-lobed halfway to middle, pale beneath: cup about ⅓ length of nut. N. S. to Pa. and Ia. Var. **maxima** is a taller tree with larger acorns. N. S. to Fla. and Tex.

brutia: *Q. Robur.*

camata pendula: *Q. Toza* var.

Catesbæi. To 50 ft. and more: related to *Q. rubra,* with lvs. glabrous and shining underneath and petioles very short, deciduous: cup deeper, with scales over edge and down inside. N. C. to Fla. and west.

Cerris. Turkey O. To 100 ft.: lvs. deciduous, oblong, to 5 in. long, with 3–8 pairs of entire or toothed lobes, grayish-pubescent beneath when young: cup mossy, about ½ length of nut. S. Eu., W. Asia. Var. **austriaca,** Austrian Turkey Oak, has shallowly lobed lvs. Var. **laciniata** has pinnatifid lvs. Var. **pendula** has drooping branches and pinnatifid lvs.

chrysolepis. Canon or Maul O. To 90 ft.: lvs. evergreen, elliptic, to 4 in. long, spiny-toothed or with entire revolute margins, glaucous and tomentose beneath: cup tomentose, about ¼ length of nut. Ore. to Lower Calif.

coccifera. Kermes O. Shrub: lvs. evergreen, broad-elliptic, to 1¾ in. long, with few spiny teeth, shining: cup about ½ length of nut. S. Eu., N. Afr., W. Asia.

coccinea. Scarlet O. To 80 ft.: lvs. deciduous, oblong or elliptic, to 6 in. long, with 7–9 very deep lobes, bright green: cup ⅓–½ length of nut. Me. to Fla. and Mo.

conferta (*Q. pannonica*). Italian O. To 120 ft.: lvs. deciduous, obovate, to 7 in. long, with usually 7 very deep lobes, dark green above, pale and pubescent beneath: cup ⅓–½ length of nut. S. Eu.

cornea: *Lithocarpus cornea.*

crispula: *Q. mongolica* var. *grosseserrata.*

cupressoides: *Q. Robur.*

cuspidata: *Castanopsis cuspidata.*

densiflora: *Lithocarpus densiflora.*

dentata (*Q. Diamio*). To 80 ft.: lvs. deciduous, obovate, to 1 ft. long, with 4–9 pairs of rounded lobes or teeth, pubescent beneath: cup with spreading scales, ½ or more length of nut. Japan, Korea, China. Var. pinnatifida has lvs. divided almost to midrib.

Diamio: *Q. dentata.*

dumosa. California Scrub O. Shrub to 8 ft.: lvs. evergreen, oblong to elliptic, to 1 in. long, spiny-toothed or entire, glossy dark green above, pale and pubescent beneath: cup about ½ length of nut. Calif.

ellipsoidalis. To 80 ft. or more: lvs. deciduous, elliptic, to 4 or 5 in, long, with deep narrow lobes bearing pointed teeth, becoming glabrous underneath except in axils of veins: cup ⅓ or ½ length of nut. Man. to Mich. and Ia.

Engelmanni. To 60 ft.: lvs. evergreen, oblong, about 2 in. long, entire or sometimes toothed, pale beneath: cup ½ length of nut. S. Calif.

falcata: *Q. rubra.*

Gambelii. Shrub to 15 ft.: lvs. deciduous, broad-obovate, divided about half way into rounded lobes, glossy above, slightly pubescent beneath: cup about ½ length of nut. Colo. to New Mex.

Garryana. Oregon O. To 100 ft.: lvs. deciduous, oblong-obovate, to 6 in. long, divided about half way into 3–5 pairs of entire or toothed lobes: cup pubescent, about ⅓ length of nut. B. C. to Calif.

georgiana. Shrub or tree to 40 ft.: lvs. deciduous, obovate, 2½ in. long, lobed halfway to midrib or sometimes pinnatifid, shining above, pale beneath: cup ⅓–½ length of nut. Ga.

glabra: *Lithocarpus glabra.*

glandulifera: *Q. serrata.*

glauca. To 50 ft.: lvs. evergreen, oblong, to 5 in. long, toothed above middle, silky and glaucous beneath when young: cup pubescent, about ⅓ length of nut. Asia.

heterophylla. Hybrid between *Q. Phellos* and either *Q. borealis* var. *maxima* or *Q. velutina*. N. J. to Tex.

Ilex. Holly or Holm O. To 60 ft.: lvs. evergreen, ovate to lanceolate, to 3 in. long, toothed or entire, shining dark green above, yellowish- or whitish-tomentose beneath: cup about ½ length of nut. S. Eu. Var. rotundifolia (*Q. Ballota*) has smaller ovate lvs. Var. Fordii is of pyramidal habit.

ilicifolia. Scrub O. Much branched shrub to 10 ft. or more: lvs. deciduous, obovate, to 4½ in. long, with 2 pairs of broad entire or bristly-toothed lobes, whitish-tomentose beneath: cup ½ length of nut. Me. to Va. and Ky.

imbricaria. Shingle O. To 60 ft.: lvs. deciduous, oblong, to 6 in. long, entire, pale and pubescent beneath: cup ⅓ to ½ length of nut. Pa. to Ga. and Ark.

Kelloggii. California Black O. To 80 ft. or more: lvs. deciduous, oblong, to 6 in. long, with narrow sharp-dentate lobes half way to middle, pubescent or sometimes becoming glabrous underneath: cup ⅓ or more as long as nut. Calif., Ore.

lævigata. Lvs. thick and glabrous, oblong-lanceolate, to 7 in. long, entire or slightly toothed. Japan.

lanuginosa (*Q. pubescens*). Pubescent O. Shrub or tree to 45 ft.: lvs. deciduous, obovate, to 4 in. long, with 4–8 pairs of rounded lobes, grayish-pubescent beneath: cup tomentose, ⅓–½ length of nut. S. Eu., W. Asia.

laurifolia. Laurel O. To 60 ft.: lvs. deciduous or half-evergreen, oblong, to 6 in. long, entire or sometimes slightly lobed, shining dark green above, light green beneath: cup ¼ length of nut. Va. to Fla. and La.

lobata. Valley O. To 100 ft.: lvs. deciduous, obovate, to 3 in. long, with 7–11 obtuse lobes, grayish-tomentose beneath: cup ¼–⅓ length of nut. Calif.

longifolia: *Q. Robur* var. *holophylla.*

Louettei: *Q. sessiliflora* var. *mespilifolia.*

lyrata. Overcup O. To 100 ft.: lvs. deciduous, obovate-oblong, to 8 in. long, deeply pinnatifid with a large terminal lobe, white-tomentose beneath or green and pubescent: cup usually inclosing the nut. N. J. to Fla. and Tex.

macranthera. To 60 ft.: lvs. deciduous, obovate, to 7 in. long, with 8–10 pairs of broad lobes, grayish-tomentose beneath: cup about ½ length of nut. W. Asia.

macrocarpa. Burr or Mossy-Cup O. To 80 ft. or more: lvs. decidous, obovate, to 10 in. long, pinnatifid with large terminal lobe, grayish-pubescent beneath: cup with fringe-like border, about ½ length of nut. N. S. to Pa. and Tex.

marilandica. Blackjack O. To 50 ft. but mostly less: lvs. deciduous, broader upward or toward apex, to 6 or 8 in. long, shallowly lobed at top, tomentose underneath: cup ⅓ or more length of nut, the rim scales recurving. N. Y. south and west.

Michauxii: *Q. Prinus.*

Mirbeckii. Tree to 100 ft.: lvs. deciduous, ovate-oblong, to 5 in. long, coarsely toothed, shining above: cup about ½ length of nut. Spain, N. Afr.

mongolica. Mongolian O. To 100 ft.: lvs. deciduous, short-stalked and clustered at ends of branches, obovate, to 8 in. long, with 7–10 broad teeth: cup with short fringe, about ⅓ length of cup. China, Korea, Japan. Var. grosseserrata (*Q. crispula*) has smaller lvs. with acute teeth.

montana. Chestnut O. Often confused with *Q. Prinus*, but lvs. yellow-green above and only slightly pubescent beneath when young, turning dull orange instead of crimson in autumn. Me. to S. C. and Ala.

Muhlenbergii. Yellow Chestnut O. To 100 ft. and more: lvs. deciduous, oblong to lance-oblong, to 6 in. long, with incurved coarse teeth along sides, pubescent underneath: cup nearly half length of nut. New England west and south.

myrsinæfolia (*Q. Vibreyana*). To 60 ft.: lvs. evergreen, lanceolate, to 5 in. long, toothed, shining above, glaucous beneath: cup about ⅓ length of nut. Japan.

nigra (*Q. aquatica*). Water O. To 80 ft.: lvs. deciduous, obovate, to 3 in. long, 3-lobed at apex or entire, bluish-green above: cup ¼–⅓ length of nut. Del. to Fla. and Tex.

palustris. Pin O. To 80 ft. or more: lvs. deciduous, elliptic, to 5 in. long, with 5–7 oblong toothed lobes, bright green: cup about ⅓ length of nut. Mass. to Del. and Ark.—Planted as a street or avenue tree.

pannonica: *Q. conferta.*

pectinata: *Q. Robur* var.

pedunculata: *Q. Robur.*

Phellos. Willow O. To 60 ft.: lvs. deciduous, linear-oblong, to 4 in. long, entire, light green and shining above: cup about ¼ length of nut. N. Y. to Fla. and Tex.

phillyræoides. To 30 ft.: lvs. evergreen, elliptic or obovate, to 2½ in. long, wavy-toothed: cup tomentose. Japan, China.

prinoides. Chinquapin O. Shrub to 6 ft. or rarely small tree: lvs. deciduous, oblong, to 5 in. long, toothed, grayish-pubescent beneath: cup about ½ length of nut. Me. to Ala. and Tex.

Prinus (*Q. Michauxii*). Basket O. To 100 ft.: lvs. deciduous, obovate, to 7 in. long, coarsely toothed, shining bright green above, grayish-pubescent beneath: cup ⅓–½ length of nut. Del. to Fla. and Tex.

pubescens: *Q. lanuginosa.*

pyrenaica: *Q. Toza.*

ramosa: *Q. alba.*

repanda: *Q. alba* var.

Robur (*Q. pedunculata. Q. brutia. Q. cupressoides*). English O. To 80 ft. or more: lvs. deciduous, obovate, to 5 in. long, with 3–7 pairs of rounded lobes: cup about ⅓ length of nut. Eu., N. Afr., W. Asia. Some of the hort. vars. are: **atropurpurea**, lvs. purple; **Concordia**, lvs. bright yellow; **fastigiata**, of columnar habit; **filicifolia**, lvs. deeply cut into linear crisped lobes; **holophylla** (*Q. pedunculata* var. *longifolia*), lvs. entire; **pectinata**, lvs. deeply cut into narrow lobes; **pendula** (var. *Dauvessei*), branches drooping.

rubra (*Q. falcata*). Spanish Red O. To 80 ft. or more: lvs. deciduous, obovate, to 8 in. long, with 3–7 deep acute lobes, pubescent beneath: cup ¼–⅓ length of nut. N. J. to Fla. and Tex.—Formerly the name *Q. rubra* was mistakenly applied to the tree now known as *Q. borealis.*

sempervirens: *Q. virginiana.*

serrata (*Q. glandulifera*). To 50 ft.: lvs. deciduous, oblong-obovate, to 6 in. long, sharply toothed, shining above, grayish-pubescent beneath: cup about ⅓ length of nut. Japan, Korea, China.—Some of the material known as *Q. serrata* is *Q. acutissima.*

sessiliflora. DURMAST O. Very similar to *Q. Robur*, and differing chiefly in the longer petioles and almost sessile frs. Eu., W. Asia. Var. **mespilifolia** (*Q. Louettei*) has narrow nearly entire lvs.

stellata. POST O. To 100 ft. but usually much less: lvs. deciduous, obovate, lyrate-lobed, 6–8 in. long, lobes obtuse, grayish or whitish underneath: cup ⅓ or more length of nut. Mass. south and west.

Suber. CORK O. To 60 ft., with thick bark yielding the cork of commerce: lvs. ovate, to 3 in. long, toothed, shining dark green above, grayish-tomentose beneath: cup ⅓–½ length of nut. S. Eu., N. Afr.

tinctoria: *Q. velutina.*

Toza (*Q. pyrenaica*). To 60 ft., suckering: lvs. deciduous, obovate, to 6 in. long, with 5–6 pairs of acute deep lobes, yellowish-tomentose beneath: cup tomentose, ⅓–½ length of nut. S. Eu. Var. **pendula** (*Q. camata pendula*) has drooping branches.

Turneri. Hybrid between *Q. Robur* and probably *Q. Ilex*, half-evergreen tree to 50 ft. with toothed lvs.

undulata. To 30 ft.: lvs. deciduous, elliptic-oblong, to 3 in. long, coarsely toothed or lobed, bluish-green and pubescent: cup about ½ length of nut. Colo. to Mex. and Tex.

utahensis. To 50 ft.: lvs. deciduous, oblong, to 5 in. long, with 3–5 pairs of deep broad lobes, shining dark green, pale and pubescent beneath: cup pubescent, about ⅓ length of nut. Colo. to New Mex. and Tex.

variabilis. To 80 ft.: lvs. deciduous, oblong, to 6 in. long, with bristle-like teeth, white-tomentose beneath: cup with curved scales, ½ or more length of nut. China, Korea, Japan.

velutina (*Q. tinctoria*). BLACK O. To 100 ft. or more: lvs. deciduous, ovate to oblong, to 10 in. long, with 7–9 broad toothed lobes, shining dark green above: cup pubescent, with fringe-like border, about ½ length of nut. Me. to Fla. and Tex.

ventricosa: *Q. Ægilops.*

Vibreyana: *Q. myrsinæfolia.*

virens: *Q. virginiana.*

virginiana (*Q. sempervirens. Q. virens*). LIVE O. To 60 ft.: lvs. evergreen, elliptic to oblong, to 5 in. long, usually entire, shining dark green above, whitish-tomentose beneath: cup tomentose, about ¼ length of nut. Va. to Fla. and Mex.

QUILLAJA. *Rosaceæ.* S. American evergreen trees, the bark often with soap-like and medicinal properties, having alternate simple lvs., unisexual fls. in clusters, and fr. of 5 leathery follicles united at base; grown out-of-doors in the S. and Calif. Propagated by cuttings under glass.

Saponaria. SOAP-BARK TREE. To 60 ft.: lvs. ovate, to 2 in. long, sparingly toothed, shining: fls. white, about ½ in. across. Chile.

QUINCE. Several related plants are known as quince, grown for the ornamental early spring bloom and for the edible fruit. The ornamental or "flowering" quinces may be found under the entry *Chænomeles.*

The pomological quinces are two, the common or true quince, *Cydonia oblonga*, and the Chinese quince, *Chænomeles sinensis.* The latter is little known in North America although long ago introduced. It will stand on the seaboard as far north as Long Island, but is not generally hardy north of Philadelphia in the East. The fruits become 6 inches or more long, and have been recommended for culinary purposes.

The common orchard quince, *Cydonia oblonga*, is a small crooked-branched tree native in Asia, grown in temperate climates for its fruit which is used in preserves and cookery. It is a slow-growing shallow-rooted tree, requiring a rather heavy moist deep soil for best results, but very heavy lands are likely to produce green fruit of poor quality. The trees may be set one rod apart both ways which is greater than the usual full height of large specimens. The quince propagates from long hardwood cuttings, also from seeds and the seedlings are sometimes employed as stocks on which to graft or bud named varieties or for the dwarfing of the pear. Plants are set when one or two years old; the second or third year thereafter a few fruits should be produced and then the crop should be steady for any number of years. The quince is but little hardier than the peach in its wood and may be severely injured at temperatures of 15° to 20° below zero. In the warmer parts of the country where the humidity is high, fire-blight is the limiting factor. Commercial quince culture is therefore largely restricted to the favored fruit regions of California, Ohio, Pennsylvania, New York and Ontario. In home planting it is worth attention over a much wider area.

Quinces may be grown either as bushes or trees. The bush form has the advantage of easier blight control whereas the tree form facilitates borer control and tillage. Cultivation must be practiced with care for if the trees are forced into rapid growth they are subject to fire-blight. The sod-mulch system is often satisfactory especially if supplemented with moderate amounts of manure, or sodium nitrate at the rate of 2 pounds for the tree, applied in the early spring. Cultural practice must be governed by the growth, aiming to avoid over-growth on the one hand and stunting on the other. Aside from occasional thinning out of the older trees as they become thick and brushy, the quince needs very little pruning. The cutting necessary to control fire-blight may be sufficient. Annual crops may be expected, a good sized quince bush or tree yielding a bushel or more.

The fruit is hand-picked when mature and well colored. Although a hard fruit, the quince shows bruises very readily and must, therefore, be handled with great care. In the East, quinces go to the general market in barrels or bushels. Fancy grades may be packed in smaller baskets. The fruit may be kept for a relatively short time as compared with the apple at 30° to 32°. Usually however, the crop is used at once. In some parts of the world quinces of much higher quality have been developed than any grown in North America. Here the one variety is the Orange, outstanding for its earliness, quality and color. Other varieties sometimes grown are the Champion, Meech, Fuller and Smyrna.

Fire-blight, the worst disease of the quince, can be kept in check by avoiding over-stimulation of the trees and by cutting out the diseased twigs as with the pear. Borers, often a serious pest, can be dug out as in the case of the apple. The codlin-moth and quince curculio may be combatted with powdered arsenate of lead 2 pounds to 50 gallons of water, applied when the petals fall and again three weeks later. There are other insects and diseases of lesser although often great importance.

QUINCULA. *Solanaceæ.* One spreading or prostrate per. herb suitable for dry sunny places in the rock-garden. Q. **lobata** (*Physalis lobata*). Lvs. spatulate to oblong, sinuate or pinnatifid: fls. purplish, to 1¼ in. across, wheel-shaped, usually in pairs. Kans. to Mex.

QUININE: see *Cinchona.*

QUINOA: *Chenopodium Quinoa.*

QUINTINIA. *Saxifragaceæ.* Shrubs or trees native in Australia and New Zeal., having alternate leathery lvs. and small fls. in many-fld. racemes; intro. in Calif.

serrata. Tree to 30 ft., covered with minute scales: lvs. linear-lanceolate to oblong, to 6 in. long, toothed: fls. pale lilac, ¼ in. across, in erect axillary racemes to 4 in. long. New Zeal.

QUISQUALIS. *Combretaceæ.* Somewhat climbing shrubs with opposite simple lvs., showy fls. in spikes, and 5-angled or -winged fr.; grown out-of-doors far S. and sometimes under glass. Propagated by softwood cuttings over heat.

indica. RANGOON-CREEPER. More or less climbing or lopping, without tendrils: lvs. to 5 in. long, deciduous: fls. fragrant, with slender green calyx-tube to 3 in. long and petals white changing to pink and red, in terminal drooping spikes. Burma, Malaya, Philippines.

R

RACEME: a simple, elongated, indeterminate cluster with stalked flowers.

RACHIS: axis bearing flowers or leaflets; petiole of a fern frond.

RADERMACHIA. *Bignoniaceæ.* Asian trees with opposite pinnate lvs., large bell-shaped fls. in terminal panicles, and linear capsular frs.; grown in subtrop. climates. Propagated by seeds, cuttings and air-layering.

pentandra (*Oroxylon flavum*). To 20 ft., evergreen: lvs. bipinnate into oblong entire lfts. to 7 in. long: fls. yellow, 2 in. long and 3 in. across, in panicles 1 ft. long: frs. to 3 ft. long. China.

RADIATE: standing on and spreading from a common center; also, with ray-flowers, as in the Compositæ.

RADICAL: belonging or pertaining to the root. Radical leaves are those that arise from the root or crown, i.e., basal.

RADICULA ARMORACIA: *Armoracia rusticana.*

RADISH (*Raphanus sativus*). The small tuberous roots of radish are eaten with us as a relish and an accessory, but the harder larger summer and autumn varieties are used freely in Europe, and in the Far East the durable winter radishes are important articles of food. These various races, with roots of many sizes, shapes and colors, are accounted as forms of one species, *Raphanus sativus*; and this species is unknown as an indigenous plant and is supposed to be a development from the weedy charlock, *R. Raphanistrum.* Another very different race is the rat-tailed radish, in which the seed-pods are highly developed and the root spindling and hard; these pods are often 1 foot or more long, soft and thick, and are eaten either raw as are radishes or used in pickles; this plant is *R. sativus* var. *caudatus*; it has been called "aerial radish".

The small radishes so much used as table delicacies should be grown quickly in order to develop crispness; seeds may be sown as early in the spring as the ground is fit. Of quick-growing varieties in good soil and the best conditions, edible tubers may be had in four to six weeks. Seeds may be sown every week up to midspring for succession. If the small seeds are sifted out and only the large ones planted, better results are to be expected. Radishes also force readily, for which certain varieties are specially adapted. They may be grown in hotbeds and in frames. The seeds germinate quickly. They are sown in drills 6–12 inches apart, and the plants are thinned to 1–3 inches as they grow.

For main summer use, another set of varieties is adapted, requiring a longer time, although the spring kinds may be grown on ground sufficiently cool and moist.

The common spring radishes run to seed the same season, but the oriental winter kinds make deep hard roots, sometimes 2 feet long, and bloom the following year.

The most serious radish pest is the root-maggot. Rotation is to be practiced if the maggot is abundant. In frames, the plants may be screened with cheesecloth to keep the parent fly away. Aphis may be combatted by a spray of Black Leaf 40.

RAFFIA: *Raphia Ruffia.*

RAGGED ROBIN: *Lychnis Flos-cuculi.*

RAGWORT: *Senecio.*

RAIMANNIA: *Œnothera.*

RAIN-TREE: *Samanea Saman.*

RAISIN: see *Grape.* **-Tree, Japanese:** *Hovenia dulcis.*

RAJANIA. *Dioscoreaceæ.* W. Indian twining vines with alternate lvs. and small greenish diœcious fls. in racemes; one species sometimes grown for ornament; it has a winged 1-carpelled fr.; tubers of some species said to be eatable.

pleioneura. Cockscomb Yam. Aerial tubers large and very irregular: lvs. ovate, 6 in. across, heart-shaped at base and sharply pointed at tip. Cuba.

RAMIE: *Bœhmeria nivea.*

RAMONA: *Audibertia.*

RAMONDA. *Gesneriaceæ.* Small herbs with basal lvs. and broad-campanulate fls. borne in few-fld. clusters on leafless scapes: native in mts. of Eu. and grown in rock-gardens. Hardy in the N. with winter protection. Propagated by seeds or old plants by division.

Nathaliæ (*R. serbica* var. *Nathaliæ*). Lvs. oval, wavy-toothed, hairy: fls. lavender-blue with golden center, 4-parted. Serbia, Bulgaria.

pyrenaica. Per. to 3 in.: lvs. ovate, deeply toothed, hairy: fls. purple or white in var. alba, 1 in. across, 5-parted, in spring. Pyrenees.

RAMONTCHI: *Flacourtia indica.*

RAMPION: *Campanula Rapunculus.* **Horned:** *Phyteuma.*

RANEVEA (*Ravenea*). *Palmaceæ.* One attractive unarmed rather small feather-palm, diœcious or monœcious, of the Comoro Isls. in the Indian Ocean, that has been grown under glass: spadices among the lvs., simply branched; stamens 6: fr. very small, black. Allied to Hyophorbe, which differs in stouter habit, spadices below the lvs. and different arrangement of fls. **R. Hildebrandtii:** slender palm, blooming when only 4 ft. high: lvs. 3 ft. long, long-petioled, dark green both sides; pinnæ about 40, narrow, long-pointed: spadix slender, the pistillate to 4 ft., bending over with the weight of bright scarlet pea-like frs.

RANGOON-CREEPER: *Quisqualis indica.*

RANUNCULACEÆ. CROWFOOT or BUTTERCUP FAMILY. Herbs or sometimes shrubs of about 50 genera in the north temp. zone, with alternate or opposite lvs., mostly bisexual fls. with 2–many sepals and petals or sometimes petals wanting, numerous stamens, few or many superior pistils, and fr. an achene, follicle or berry. The family contains many ornamental and flower-garden subjects as well as medicinal plants. Most of the species are hardy in the northern states and Canada. Many of the kinds are alpine or boreal and are prized in rock-gardens. Genera cult. are Aconitum, Actæa, Adonis, Anemone, Anemonella. Anemonopsis, Aquilegia, Caltha, Cimicifuga, Clematis, Coptis, Delphinium, Eranthis, Glaucidium, Helleborus, Hepatica, Hydrastis, Isopyrum, Leptopyrum, Nigella, Pæonia, Ranunculus, Thalictrum, Trautvetteria, Trollius, Zanthorhiza.

RANUNCULUS. BUTTERCUP. CROWFOOT. *Ranunculaceæ.* Herbs of wide distribution, having alternate simple or compound lvs., yellow, white or red fls. with mostly 5 sepals and petals and many stamens, and fr. a head of achenes; grown in the flower-garden and borders.

The florists ranunculus is *R. asiaticus* (and sometimes *R. aconitifolius*), and is propagated by the tuberous roots which should be taken up and stored over winter. It may be grown out-of-doors in the summer and in the greenhouse. Other buttercups are propagated by seeds or division of the plants in spring. Most of the crowfoots are yellow-flowered, but there are a number of white kinds particularly in the section (or genus) Batrachium which includes aquatic and bog plants useful for colonizing in ponds and about the margins. Many of the crowfoots are alpine and boreal and well adapted to rock-gardens. Only two or three species have been much modified under domestication into color forms and doubles. The following species are perennial unless otherwise stated.

abortivus. Bien., to 2 ft.: basal lvs. broad-ovate and toothed, st.-lvs. divided into linear or oblong lobes: fls. yellow, ¼ in. across. N. Amer.

aconitifolius. To 3 ft., much branched, the roots tuberous: lvs. palmately 3–5-parted into broad toothed segms.: fls. several to many, white, ¾–1 in. across; sepals glabrous. Eu. Var. flore-pleno has double fls. and **luteo-plenus** double golden-yellow fls.

acris. To 3 ft., much branched, the roots fibrous: lvs. palmately 3–7-parted into narrow toothed or lobed segms.: fls. many, golden-yellow, ¾–1 in. across; sepals hairy. Eu.; nat. in N. Amer. Var. flore-pleno has double fls.

adoneus. To 8 in.: lvs. 2–3-ternately parted into linear lobes: fls. 1–2, golden-yellow, 1 in. across; sepals hairy. Mts. Colo., Wyo.

alpestris. To 6 in.: lvs, palmately 3-lobed: fls. usually solitary, white, ¾ in. across; sepals glabrous. Mts. of Eu.

amplexicaulis. To 1 ft.: lvs. simple, oval-lanceolate, st.-clasping, glaucous: fls. 2–3, white, 1 in. or more across; sepals glabrous. Mts. of Eu.

anemonoides. To 6 in.: lvs. 3-pinnate into finely divided segms., glaucous: fls. white or pinkish, to 1½ in. across. Alps.

asiaticus. TURBAN and PERSIAN B. To 1½ ft., simple or slightly branched, the roots tuberous: lvs. ternate or biternate into narrow toothed segms.: fls. 1–4, long-stalked, bright yellow, to 1½ in. across, in the hort. forms very double; sepals hairy. S. E. Eu., S. W. Asia. Var. **superbissimus** is taller with larger fls.

Broteri. To 2 ft., branching, the roots slightly bulbous: lvs. deeply 3-parted into roundish toothed segms.: fls. several, yellow, about 1 in. across; sepals hairy. Spain.

bulbosus. To 1 ft., the roots bulbous: lvs. 3–5-parted into lobed or cut segms., the terminal stalked, the lateral sessile: fls. solitary or few, bright yellow, about 1 in. across; sepals reflexed, hairy. Eu.; nat. in E. U. S. Var. flore-pleno has double fls.

Cymbalaria (*Halerpestes Cymbalaria*). To 8 in., with rooting stolons: lvs. mostly basal, oval to reniform, cordate, crenate, to ¾ in. long: fls. 1–3, yellow, to ½ in. across; sepals glabrous. N. Amer., S. Amer., Asia.

delphinifolius: confused name in hort.

Ficaria (*Ficaria Ficaria*). Sts. decumbent, roots fleshy: lvs. ovate-cordate, to 2 in. long: fls. solitary on scapes to 5 in. high, golden-yellow, 1 in. across; petals 8 or 9; sepals 3. Eu.; nat. in E. N. Amer.

glacialis. To 6 in.: lvs. palmately 3–5-parted into lobed segms.: fls. 1–3, white or reddish, to 1 in. across; sepals very hairy. Mts. of Eu., Greenland.

gramineus. To 1 ft.: lvs. linear, entire, grass-like: fls. 1–7, yellow, to 1 in. across; sepals glabrous. Eu., Morocco.

illyricus. To 1½ ft., white-silky hairy: lvs. deeply 2–3-parted into linear-lanceolate segms.: fls. 1–3, yellow. S. E. Eu.

Lingua. To 3 ft. and more, the roots fibrous: lvs. lanceolate, to 10 in. long, sessile, entire or slightly toothed: fls. in loose panicles, yellow, 1½ in. across; sepals hairy. Eu., Asia.

Lyallii. Erect showy plant 1–4 ft.: lower lvs. large, peltate, simple, crenate; st.-lvs. few: fls. white or cream-color, 2–3 in. across; sepals hairy. New Zeal., and there sometimes called "Mountain lily."

nemorosus. To 1 ft.: lvs. palmately 3-parted into lobed segms.: fls. several, yellow, ¾–1 in. across; sepals hairy. Mts. of Eu.

ophioglossifolius (*R. ophioglossoides*). Ann. with hollow st.: lvs. undivided, the lower cordate-ovate and upper oblong-lanceolate: fls. small, pale yellow; sepals glabrous: achene slightly tuberculate. Medit. region.

ovalis. To 1½ ft.: basal lvs. oval to ovate-oblong, 1 in. or more long, toothed; st.-lvs. divided into narrow lobes: fls. yellow, 1 in. across. Lab. to Alta. and Colo.

parnassifolius. To 8 in.: basal lvs. long-stalked, ovate or cordate, shiny above, white-hairy below: fls. 1–6, white or rarely purplish, about 1 in across; sepals hairy. Alps, Pyrenees.

pyrenæus. To 1 ft.: lvs. basal, linear or lanceolate, entire: fls. 1–4, white, to 1 in. across; sepals glabrous. S. Eu.

repens. CREEPING B. To 2 ft., with runners rooting at joints: lvs. long-stalked, 3-parted into broad toothed or lobed segms.: fls. yellow, ¾–1 in. across; sepals slightly hairy. Eu., N. Amer. The common form in gardens is var. pleniflorus (var. *flore-pleno*, *R. speciosus*) with double fls.

Seguieri. Very similar to *R. glacialis* but distinguished by the glabrous sepals. Mts. of Eu.

septentrionalis. To 3 ft., some of the sts. procumbent: lvs. 3-parted into lobed segms.: fls. bright yellow, 1 in. across. Swamps N. B. to Ga. and Kans.

speciosus: *R. repens* var. *pleniflorus.*

RAOULIA. *Compositæ.* Small tufted or creeping per. herbs of New Zeal. and Australia, having alternate entire lvs. and small solitary heads of disk-fls.; pappus of hairs; adapted to the sunny rockery and grown in Calif.

australis. Sts. prostrate and matted, to 6 in. long: lvs. imbricated, to ⅛ in. long, white- or yellowish-tomentose: heads to ¼ in. long, the inner bracts of involucre pale yellow and shining. New Zeal.

glabra. Prostrate: lvs. loosely imbricated, to ⅕ in. long, pale yellow-green, glabrous or nearly so: heads to ⅓ in. across, the inner bracts of involucre with white radiating tips. New Zeal.

tenuicaulis. Sts. prostrate, to 10 in. long: lvs. loosely imbricated, to 1/10 in. long, grayish-tomentose or nearly glabrous: heads to ⅙ in. long, the inner bracts of involucre dry and brown-tipped. New Zeal.

RAPE (*Brassica Napus*). In North America, primarily a forage crop for late autumn and early spring pasturing; the seed is sown late, as for rutabagas, sometimes following a grain crop; if the land is good and rains are sufficient, excellent late forage is secured, and as the plants withstand the winter they also give good spring pasturage if not previously grazed too close; it soon runs to seed. Hogs and lambs are sometimes pastured or soiled on rape, as well as other animals. Dwarf Essex is the prevailing variety. It is sown either broadcast or in drills in June or July or sometimes even in May; better results are to be expected in drills far enough apart to allow of tillage; about 3 pounds of seed are required for an acre of drills.

Annual or summer races of rape, presumably of the same species, are grown in some countries for the seed, used for oil and as birdseed.

RAPHANUS. *Cruciferæ.* Ann., bien. and per. branching tall herbs of Eurasia, of a few species, interesting to hort. because it includes the radish: lvs. mostly lyrate-lobed or pinnatifid: fls. white to purplish to yellowish, in racemes: fr. a terete spongy indehiscent long-beaked pod or silique, commonly constricted between the seeds. See *Radish.*

caudatus: *R. sativus* var.

sativus. Radish. Root developed into an edible short or long tuber: st. produced first or second year from seeds, bearing white or lilac veined fls. Var. **caudatus** (*R. caudatus*). Rat-tailed Radish. Root not tuberous: pods 8–12 in. long, thick, used for pickles. Var. **longipinnatus.** Lvs. to 2 ft. long, deeply pinnatifid: root usually long and durable: known mostly as Chinese radish; much grown in the Orient.

RAPHIA. *Palmaceæ.* Twenty monœcious feather-palms, all but one native in Afr., with gigantic erect and arching lvs., unarmed except perhaps on the sheaths, monocarpic (dying after the first fruiting): trunk short and stout, sometimes branched: spadices among the lvs., 3–4 ft. long, much branched, pendulous, the short ultimate branchlets thick and arranged comb-fashion on the branches, bearing many cup-shaped bracts covering the fls. which are pistillate at apex of branchlet and staminate at base, very heavy in fr.; stamens 6–16: fr. oblong or ellipsoid or turbinate, beaked, covered with imbricated scales. For cult. see *Palm.*

Ruffia. Raffia, yielding a familiar fiber from the lvs. Trunk to 25 or 30 ft.: lvs. to 65 ft. long, standing nearly erect; pinnæ very numerous, 2–5 ft. long, broad-linear and long-pointed, rather rigid, green above and whitish-powdery underneath: fr. 1–2 in. long. British E. Afr. to Madagascar; has been planted in Fla.

RAPHIOLEPIS. *Rosaceæ.* Evergreen shrubs with alternate, leathery and shining lvs., white or pink fls. in racemes or panicles, and fr. a small purple or black drupe-like pome.

Raphiolepis is grown out-of-doors in warm climates, as southern states and California. Propagated by seeds, by cuttings under glass late in summer of ripe wood, by layers, and rare sorts sometimes by grafting on cratægus.

Delacourii. Hybrid between *R. indica* and *R. umbellata*, with toothed lvs. and pink fls.

hybrida: hort. name.

indica. India-Hawthorn. To 5 ft.: lvs. oblong-lanceolate, to 3 in. long, bluntly toothed: fls. pinkish, about ½ in. across, in loose glabrous panicles. S. China.

japonica: *R. umbellata.*

ovata: *R. umbellata* var.

umbellata (*R. japonica*). Yeddo-Hawthorn. To 12 ft., but often low and spreading: lvs. obovate, to 3 in. long, slightly toothed, very thick and with revolute margins: fls. white, ¾ in. across, fragrant, in dense pubescent panicles. Japan. Var. **ovata** (var. *integerrima*, *R. ovata*) has broad nearly entire lvs.

RASPBERRY. The cultivated raspberries of North America are of three groups, the larger part of the varieties having been developed from native sources: (1) red raspberries, *Rubus idæus* native in Europe, Asia and America, and var. *strigosus* which is the commonest form of the species in the fields and woodsides of the United States and Canada; (2) black raspberries or blackcaps, *Rubus occidentalis*, native in North America; (3) purple-canes, a range of hybrids between the two. All of them have biennial canes: the shoots that bear fruit this year arose from the root last year. The canes bear but once, their second year, and are then cut away at the ground, the new shoots or canes in the meantime coming on to take their places. A few strong shoots or canes should be allowed to remain each year after the plant is established, and the superfluous and weak ones removed.

The red raspberry is one of the hardiest of fruits, growing well in most of the northern United States, in a large part of Canada and in parts of Alaska. The black raspberry is not as hardy, its range extending little north of the Great Lakes. The purple-cane raspberry is scarcely more hardy than the black. None of these fruits is tolerant of heat or drought and hence they cannot be grown to advantage south of northern Virginia and Tennessee. Deep and well-drained lands of good moisture-holding capacity are favorable. Black raspberries thrive on light soils better than the red sorts.

The black and most of the purple-cane raspberries propagate by means of "tips," which are the young plants formed when the ends of first-year canes strike the ground and take root. To insure a good stock of new plants, the tips may be laid in the ground and covered in midsummer; that autumn roots will have formed and the tip or layer may be separated, in fall or spring, for planting. Red raspberries are increased from the suckers that naturally arise from the crown or root. Both reds and blacks may be propagated from short root-cuttings, but this is not common.

In the North raspberries are commonly planted in spring. The blackcap raspberries should be set 3 to 4 feet apart, the rows 6 or 7 feet; the red varieties 3 feet apart, the rows 5 feet apart. For extra quality and yield, plants may be set in "hills" 5 by 5 feet, or 6 by 6 feet. The first year after the plants are set the blacks may be pinched back when they reach the height of 30 to 36 inches. If a very vigorous growth has been made the first season two canes may be left for fruiting, but in the case of weak growth only one cane should be allowed to fruit; the third season from setting, a good crop should be produced. In case of low-growing plants—those that have been pinched back short—a cover of straw or grass around the plants at fruiting time will help to hold the moisture, and also serve to keep the fruits clean in case of heavy rains. In the case of red raspberries, it is well to cut the cane back to the ground when it is set to force new canes from the crown.

Thorough but shallow tillage is necessary to keep down weeds and to conserve moisture. Heavy mulching with straw or other litter may be of value especially in the home planting where cultivation is impossible. Manure has proved to be the best fertilizer. A blackcap plantation should remain in good bearing condition three to five years if not diseased. Red raspberries should last considerably longer.

Pruning, in the case of the red sorts, consists in cutting out the fruiting canes immediately after picking and thinning out the weaker canes of the new growth the following spring. The new canes of the black- and purple-cane varieties are topped in the early summer at the height of about 30 inches to force branching. These branches are cut back to stubs 4–6 inches long early the next spring. Old canes are removed soon after picking the fruit, as with the red raspberry.

Fruits are picked when ripe but still firm, into pint or quart berry boxes in which they are to be marketed. For drying, the black sorts are knocked from the bushes with a bat into a large container. All raspberries are very perishable and must be rushed to market. Yields of 1200 to 2500 quarts to the acre may be expected.

Varieties are many. In this list the most desirable kinds are starred.

Hardy red varieties: * Herbert, Sunbeam, King, Loudon, Ohta, * Latham.

General list of red varieties: * Cuthbert, * June, * Herbert, King, Cayuga, Loudon, Marlboro, Ruby, Welch, * Latham, Ranere (everbearing).

Purple-cane varieties: Cardinal, * Columbian, Royal Purple.

Black varieties: * Cumberland, * Black Pearl, Gregg, Eureka, Ohio, * Plum Farmer, Honey Sweet.

Pests and diseases are likely to take heavy toll. Planting disease-free stock helps to prevent damage from anthracnose, orange-rust, mosaic and crown-gall, four of the most serious diseases. Plants having any of these maladies might better be destroyed immediately. Raspberries can usually be grown for home use without spraying, but commercial plantations may be sprayed with lime-sulfur or bordeaux mixture for anthracnose. There is no remedy for orange-rust. Short rotations—fruiting the plants only two or three years—and burning the old canes and trimmings, will do much to keep raspberry plantations healthy.

RATA: *Metrosideros robusta.*

RATAMA: *Parkinsonia aculeata.*

RATHBUNIA. *Cactaceæ.* Simple or bushy and rather slender, the sts. weak and often clambering, ribs 4–8 and prominent, spines awl-like: fls. solitary and mostly at upper areoles, narrowly tubular and the tube bearing long scales more or less united with it. Two species of W. Mex. See *Cacti.*

alamosensis (*Cereus alamosensis*). Columnar to 10 ft. and 3 in. diam., erect at first but becoming bent and rooting at tips, radial spines 11–18, centrals 1–4 and stouter: fls. scarlet, to 4 in. long, diurnal.

RATIBIDA: *Lepachys, Rudbeckia.*

RATTLE-BOX: *Crotalaria, Rhinanthus Crista-galli.*

RATTLESNAKE MASTER: *Eryngium aquaticum.* Root: *Prenanthes.*

RAVENALA. *Musaceæ.* Striking tree-like plants with palm-like trunks and large lvs. which are two-ranked toward top of st. resulting in a fan-shaped aspect: fls. bisexual, with elongated sepals, petals and stamens, borne in stiff boat-like bracts on spikes shorter than lvs. Only two species, the one commonly cult. in the tropics being **R. madagascariensis,** TRAVELERS-TREE, from Madagascar, to 30 ft. in clumps, and bearing Musa-like lvs.; the great fl.-bracts hold water; a striking object when mature.

RAVENEA: *Ranevea.*

RAY: outer modified florets of some composites, with an extended or strap-like part to the corolla; also the branches of an umbel or umbel-like cluster.

RAZOUMOFSKYA: see *Loranthaceæ.*

REBUTIA. *Cactaceæ.* S. American plants of 5 species, small and globose or short-cylindric, simple or cespitose, tubercled but not ribbed: fls. small, from old tubercles at base or side of plant. See *Cacti.*

minuscula (*Echinocactus minusculus*). Globular, to 2 in. diam., tubercles in many spirals, spines in clusters of 25–30: fls. funnelform and slightly bent near base, bright crimson, about 1 in. long, diurnal. N. W. Argentina.

RECEPTACLE: torus; the more or less enlarged or elongated end of the stem or flower-axis on which some or all of the flower-parts are borne; sometimes the receptacle is greatly expanded, as in the Compositæ; sometimes it assumes capsule-like forms, as in the hypanthium of the rose; at other times it is fleshy, as in the edible part of the strawberry.

RECURVED: bent or curved downward or backward.

RED-BERRY: *Rhamnus crocea.*

REDBUD: *Cercis.*

RED MAIDS: *Calandrinia caulescens* var. *Menziesii.* Ribbons: *Eucharidium concinnum.* Robin: *Geranium Robertianum.*

REDTOP: *Agrostis palustris.*

REDWOOD: *Sequoia sempervirens.*

REED, CANE: *Arundinaria macrosperma.* Giant: *Arundo Donax.* Sand: *Ammophila arenaria.*

REFLEXED: abruptly recurved or bent downward or backward.

REGULAR FLOWER: the parts in each series or set alike; as stamens all like each other, petals all like each other.

REHMANNIA. *Scrophulariaceæ.* Showy per. sticky-hairy herbs suitable for a cool greenhouse or outdoors in Calif. and the S., the large tubular 2-lipped fls. axillary or borne in terminal racemes: lvs. alternate and coarsely toothed or lobed; native in China and Japan. The name Rehmannia is retained by the International Lists as against Sparmannia.

Rehmannias are propagated by cuttings of growing wood or by seeds which produce blooming plants by the second year.

angulata. To 3 ft.: lvs. deeply toothed: fls. 2 in. long, red with band of scarlet at margin of upper lip and orange dots inside the lower lip. China. Var. **tigrina,** fls. spotted. Var. **tricolor,** fls. bright purple at first, then violet-rose, throat whitish.

elata. To 6 ft.: lvs. lobed, the lobes entire: fls. bright rosy purple on the lips, throat yellow dotted with red, to 3 in. long. China.

glutinosa. To 1 ft., sts. weak: lvs. coarsely toothed: fls. yellowish or purplish with purple throat and veins, about 1 in. long. China.

REICHARDIA. *Compositæ.* Ann. or per. herbs of the Medit. region with alternate or basal lvs. and long-stalked yellow heads of ligulate fls.; pappus of white bristles. Somewhat like Sonchus; sometimes planted for ornament.

picroides (*Picridium vulgare*). Per. to 2 ft., glabrous: lvs. spatulate, clasping, toothed, the lower often pinnate: heads ½ in. long, bracts of involucre margined with white.

REINECKIA. *Liliaceæ.* One per. herb from China and Japan with creeping underground sts. **R. carnea.** Lvs. basal, to 1½ ft. long and ½ in. across: fls. flesh-colored, about ½ in. long, sessile, in racemes on scapes only few in. high, the perianth-segms. partially united.—Sometimes grown as a pot-plant, and in the open in mild climates. Propagated by division. Likely to be confused with the Mondos.

REINWARDTIA. *Linaceæ.* Subshrubs with alternate lvs., yellow fls. with fugacious petals, 3–4-celled ovary with 2 ovules in each cell, and 3–4 styles; 2 Indian species.

Grown under glass; they require a temperature of 55–60°. Propagated by cuttings from strong growths in spring in sandy loam. Frequent pinching back to induce compact habit should be practiced. Adapted to outdoor culture far South and in California.

indica (*R. trigyna. Linum trigynum*). Yellow Flax. To 4 ft.: lvs. obovate, entire: fls. 1–2 in. across, styles 3.—Sometimes grown erroneously as *Linum flavum.*

tetragyna. Lvs. serrulate: styles mostly or often 4.

trigyna: *R. indica.*

RENANTHERA. *Orchidaceæ.* Epiphytes with leafy sts. and fls. in many-fld. racemes or panicles, the sepals and petals spreading and usually unequal, the lip small; grown in a warm greenhouse. See *Orchids.*

coccinea. Sts. to 6 ft.: lvs. to 5 in. long and 1½ in. wide: fls. 3 in. long, in many-fld. panicles to 2½ ft. high; dorsal sepals and petals rose spotted with scarlet; lateral sepals scarlet; lip yellow striped with red, Mar., Oct. Cochin-China.

Imschootiana. Sts. to 1 ft.: lvs. to 4 in. long and 1 in. wide: fls. to 2 in. across, in panicles to 1½ ft. long; dorsal sepals and petals yellow spotted with scarlet; lateral sepals scarlet; lip scarlet with yellow crest, June–July. India.

Lowei: *Arachnis Lowei.*

RENEALMIA NUTANS: *Alpinia speciosa.*

RENIFORM: kidney-shaped.

RESEDA. Mignonette. *Resedaceæ.* Herbs grown under glass and out-of-doors for the small fls. borne in terminal spikes.

The species mostly grown is known for its very fragrant bloom; the plant thrives in cool moderately rich soil in partially shaded positions. In the greenhouse the night temperature should be about 48°. Seeds should be sown where the plants are to grow, or else handled in pots, as they do not transplant well. Often seen in the flower-garden.

alba. White Upright M. Ann. or bien. to 3 ft.: lvs. pinnate or deeply cut: fls. greenish-white, not fragrant. S. Eu.; nat. in N. Amer.

crystallina. Ann.: lvs. 3-parted or entire near base: fls. deep yellow. Canary Isls.

odorata. Common M. Ann., becoming decumbent: lvs. entire or only notched: fls. yellowish-white, very fragrant. N. Afr. Var. **grandiflora arborea** is a large garden form.

RESEDACEÆ. Mignonette Family. Six herbaceous genera native in Medit. region, characterized by bisexual irregular fls. with 4–7 sepals and petals, 3–40 stamens, ovary of 2–6 free or united carpels, and fr. a caps. or berry. Reseda is grown for ornament.

REST-HARROW: *Ononis.*

RESURRECTION PLANT: *Anastatica hierochuntica, Selaginella lepidophylla.*

RETINISPORA, RETINOSPORA: *Chamæcyparis, Thuja.*

REVOLUTE: rolled backwards, margin rolled toward lower side.

RHABDOTHAMNUS. *Gesneriaceæ.* One much branched shrub to 5 ft., native in New Zeal. **R. Solandri.** Lvs. opposite, ovate or orbicular, ½–2 in. long, coarsely toothed, rough: fls. orange striped with red, to 1 in. long, solitary in the axils: caps. ⅓ in. long. Listed in Calif.

RHAGODIA. *Chenopodiaceæ.* Australian shrubs or rarely herbs, one planted for ornament in Calif.: lvs. alternate or opposite, entire: fls. polygamous, small, in terminal spikes or panicles: fr. a small berry.

nutans. Herb to 2 ft., prostrate or procumbent: lvs. hastate to lanceolate, 1 in. or less long: infl. to 1 in. long, often nodding.

RHAMNACEÆ. Buckthorn Family. Widely distributed temp. and trop. trees and shrubs, climbing plants, rarely herbs, some 45–50 genera, with mainly alternate simple lvs., small, regular, bisexual or polygamous whitish or greenish fls. of 4–5 sepals, petals and stamens or sometimes without petals, 2–4-celled ovary, and fr. a drupe or caps., sometimes winged. The following genera are grown for ornament and two (Hovenia, Zizyphus) also for edible frs.: Alphitonia, Berchemia, Ceanothus, Colletia, Condalia, Discaria, Hovenia, Noltea, Paliurus, Phylica, Pomaderris, Rhamnus, Sageretia, Spyridium, Trevoa, Zizyphus.

RHAMNUS. BUCKTHORN. *Rhamnaceæ.* Shrubs or small trees, mostly deciduous, with commonly alternate simple lvs., small greenish fls. in axillary clusters, umbels and racemes followed by berry-like frs.

Rhamnus furnishes considerable ornamental material suitable for shrubberies. Several species have medicinal properties. Propagated by seeds sown in autumn or stratified, by cuttings and grafting; the evergreen kinds by cuttings of mature wood under glass.

Alaternus. To 20 ft., evergreen or partially so: lvs. ovate, to 2 in. long, toothed: fls. in short racemes: fr. bluish-black. S. Eu.; adaptable south of Washington. Var. **argenteo-variegata** (var. *variegata*), lvs. margined with creamy-white.

alnifolia. To 3 ft., deciduous: lvs. ovate, to 4 in. long, toothed: fls. 2–3 together: fr. black. N. Amer.

alpina. To 10 ft., deciduous: lvs. elliptic, to 4 in. long, toothed: fls. in clusters: fr. black. S. W. Eu.

californica (*R. Purshiana* var. *californica*). COFFEE-BERRY. To 6 ft., evergreen: lvs. oblong, to 2½ in. long, finely toothed: fls. in umbels: fr. red turning black when ripe. Calif.; not to be grown in the N.

caroliniana. INDIAN-CHERRY. To 30 ft., deciduous: lvs. elliptic or oblong, to 6 in. long, finely toothed or entire: fls. in umbels: fr. red turning black when ripe. Va. to Tex.; hardy to New England.

cathartica (*R. Wicklia*). COMMON B. To 12 ft., deciduous, often with spines at ends of branchlets: lvs. ovate, to 3 in. long, toothed: fls. diœcious, in clusters: fr. black. Eu., Asia; escaped in E. U. S.; hardy far N.

chlorophora. Lvs. elliptic, to 3 in. long, toothed. Of uncertain origin.

corymbosa: name of uncertain application.

crenata. To 10 ft., deciduous: lvs. oblong, to 4 in. long, finely toothed: fls. in umbels: fr. from red to purplish-black. Japan, China; hardy to New England.

crocea. RED-BERRY. To 3 ft., evergreen: lvs. elliptic, about ½ in. long, finely toothed: fls. polygamous, without petals, in clusters: fr. bright red. Calif.

davurica. To 30 ft., deciduous: lvs. oblong, to 4 in. long, finely toothed: fls. diœcious, in clusters: fr. black. Siberia to N. China; hardy in S. New England. Var. **nipponica** has narrower longer lvs.

dumetorum. To 6 ft., deciduous, with spiny branchlets: lvs. obovate, ¾–1½ in. long, remotely toothed: fls. without petals. China; hardy N. Var. **crenoserrata** has lvs. to 2¾ in. long, wavy-toothed.

fallax. CARNIOLIAN B. To 10 ft., deciduous: lvs. oblong, to 5½ in. long, finely toothed: fls. in clusters: fr. black. Mts. of S. and Cent. Eu.; hardy to New England.

Frangula. ALDER B. To 12 ft., deciduous: lvs. obovate, to 2½ in. long, entire: fls. in umbels: fr. red turning black when ripe. Eu., N. Afr., Asia; escaped in E. U. S.; hardy far N. Var. **asplenifolia** is a feathery form with linear wavy lvs.

ilicifolia (*R. crocea* var. *ilicifolia*). To 20 ft., evergreen: lvs. oval, to 1½ in. long, spiny-toothed, often yellow beneath: fls. polygamous, without petals, in clusters: fr. bright red. Calif.

imeretina. To 10 ft., deciduous: lvs. oblong to oval, to 8 in. long, finely toothed, turning bronzy in autumn: fls. in clusters: fr. black. Caucasus; hardy to New England.

infectoria. AVIGNON BERRY. To 6 ft., spiny, deciduous: lvs. elliptic, to 1½ in. long, toothed: fr. black. S. Eu.

lanceolata. To 6 ft., deciduous: lvs. ovate-lanceolate, to 3 in. long, finely toothed: fr. black. Pa. to Tex.

Purshiana. CASCARA SAGRADA. To 20 ft., deciduous: lvs. oblong, to 8 in. long, finely toothed: fls. in umbels: fr. black. Wash. to Calif.; adaptable south of Philadelphia.

tinctoria. To 5 ft., deciduous: lvs. elliptic, to 2 in. long, toothed, pubescent beneath. S. E. Eu.

tomentella. Similar to *R. californica* but lvs. yellow- or gray-tomentose beneath. Calif. to Ariz.

utilis. To 10 ft., deciduous: lvs. oblong, to 5 in. long, finely toothed, yellowish-green: fr. black. China; probably adaptable south of N. Y.

Wicklia: *R. cathartica.*

RHAPHITHAMNUS. *Verbenaceæ.* Chilean spiny trees, one sometimes planted in S. U. S.: lvs. opposite, entire: fls. lilac, tubular, solitary or paired in the axils: drupes bright blue, fleshy.

cyanocarpus. To 20 ft., with slender spines to 1 in. long: lvs. ovate, to ¾ in. long: fls. ½ in. long: fr. globose, to ½ in. across.

RHAPIDOPHYLLUM. NEEDLE PALM. *Palmaceæ.* One low fan-palm on the coastal plain S. C. to Fla. and Miss., mostly in low grounds, remarkable for the long sharp erect needles of the lf.-sheaths: polygamo-diœcious or hermaphrodite: spadices short and condensed, head-like, buried in the lf.-sheaths and needles at the base of the plant; stamens 5–7: fr. ovoid, 1 in. or less long, drupe-like, red. **R. Hystrix.** Cespitose or stoloniferous, crown or caudex rising a few in., the spines 6–16 in. long: petioles long and slender, unarmed; lf.-blade 1½–2½ ft. across, parted nearly to base into 5– a dozen or more spreading narrow strongly ribbed stiffish segms. 1½ in. or less broad that are bifid or toothed at apex, glaucous and finely pubescent underneath.

RHAPIS. *Palmaceæ.* Low reed-like diœcious or polygamous cespitose fan-palms, about a half dozen species in Indo-China, China, Japan, two of them long grown as tub specimens and for clumps in the open in regions as mild as S. Calif. and S. Fla.: lvs. 1–2 ft. across, divided nearly to the base; sheaths fibrous: spadices among the lvs., long-stalked, branched; fls. yellowish; stamens 6: fr. a small 1-seeded berry, with a soft exterior. For cult. see *Palm.*

excelsa (*R. flabelliformis*). Sts. several to many, 5–6 ft., covered with coarse fiber: some or many of the lvs. only 3–7-parted, others to 10-parted, green both sides, the segms. uniformly curving or drooping, rather broad and notched at the end, 1½–3 in. broad at middle. Probably China.

humilis. Lower or almost stemless; sts. with finely-fibrous sheaths: segms. narrow, mostly 9 or more, the rear ones usually spreading or directed somewhat backward. China.

RHAPONTICUM: *Centaurea cynaroides.*

RHEKTOPHYLLUM. *Araceæ.* One or two tall-climbing herbs rooting at the nodes, native in W. Afr., of which one is sometimes grown in hothouses.

mirabile (*Nephthytis picturata*). Lvs. arrow-shaped, to 6 ft. long and 2 ft. broad, green variegated with pale green between the nerves, the margins deeply wavy, the petioles to 3 ft. long: spathes to 4 in. long, green outside, reddish-purple inside.

RHEUM. RHUBARB. *Polygonaceæ.* Asian stout per. herbs with clumps of large basal lvs., small greenish or whitish fls. in panicled clusters or racemes on tall hollow sts., and fr. a winged achene; one species grown for the edible lf.-stalks and others for bold foliage effects. See *Rhubarb.*

Collinianum. Perhaps a hybrid: lvs. with broad much cut lobes: fls. red. China.

emodi. Lvs. cordate-ovate, wavy-margined, somewhat copper-colored: fls. dark purple, stalks to 10 ft. high. Himalayas.

officinalis. Lvs. round-oval, 3–7-lobed, the lobes notched, to 3 ft. across: fl.-stalks to 10 ft. high. W. China.

palmatum. Lvs. nearly orbicular, heart-shaped at base, deeply palmately lobed, the lobes sometimes again divided: fl.-stalks to 6 ft. high. N. E. Asia. Var. **atrosanguineum** has dark red panicles and var. **tanguticum** longer lvs. not so deeply lobed.

Rhaponticum. Garden R. Pie-Plant. Wine-Plant. Lvs. ovate, heart-shaped at base, the margins entire but wavy, to 1½ ft. long: fl.-stalk to 6 ft. high. Siberia.

spiciforme. Lvs. orbicular or cordate, very leathery, reticulated beneath: fl.-stalk to 2 ft. high. Himalayas.

RHEXIA. Meadow-Beauty. *Melastomaceæ.* Per. herbs native in N. Amer., with opposite simple 3–5-nerved lvs., terminal fls. solitary or in cymes, and capsular frs.; cult. in borders and wild-gardens in moist situations. Propagated by tubers and seeds.

mariana. To 2 ft., sts. cylindric, very hairy-pubescent: lvs. narrow, oblong or linear-oblong, to 1½ in. long: fls. pale purple, about 1 in. across, in loose cymes. L. I. to Fla. and Tex.

virginica. To 1½ ft., the roots bearing tubers, sts. square, somewhat pubescent: lvs. ovate, to 2 in. long: fls. rosy-purple, 1½ in. across, in cymes. Me. to Fla. and La.

RHINANTHUS. *Scrophulariaceæ.* A few ann. herbs of the northern hemisphere, with opposite lvs., yellow, blue or violet 2-lipped tubular fls., sometimes parti-colored, and capsular frs.; sometimes placed in the rock-garden or elsewhere.

Crista-galli. Rattle-Box. To 1½ ft.: lvs. lanceolate, to 2 in. long, toothed: fls. yellow with purple spots on lips, about ½ in. long. Mts., Eu., Asia, northern part of N. Amer.

RHIPOGONUM (or *Ripogonum*). *Liliaceæ.* Climbing shrubs of Australia and New Zeal., with mostly opposite lvs., small fls. with deciduous perianth borne in racemes, and fr. a berry; one species intro. into Calif.

scandens. Lvs. ovate-oblong to oblong-lanceolate, to 5 in. long, leathery: fls. greenish, ⅓ in. across, in axillary racemes to 6 in. long: berries bright red, ⅓ in. across. New Zeal.

RHIPSALIS. *Cactaceæ.* Mostly epiphytic cacti, a number of them grown as pot subjects in greenhouses, hanging or clambering or sometimes erect and more or less rooting or emitting aerial roots, the sts. branched, terete, angled, or flattened and leaf-like, sometimes as slender as strings, the areoles on the edges or angles and bearing hairs, wool and bristles: fls. small, with few segms., opening night or day: fr. often resembling that of the mistletoe. Fla. to Argentina, some 60 species. See *Cacti.*

The species of Rhipsalis are interesting pot subjects and are easily grown; propagated by cuttings, and by seeds when available.

capilliformis. Very slender and weak, the main branches very long and lateral ones short, all cylindrical: fls. many along sides, cream-color, ¼ in. or less across. Brazil.

cassutha (commonly but not originally spelled *cassytha*). Mistletoe Cactus. Growing on trees or rocks hanging in many strands to 30 ft., the branches terete and very slender, somewhat bristly when young but becoming naked: fls. cream-color, solitary, about ¼ in. across. Fla. to Brazil and Peru, also Ceylon and trop. Afr.

cereuscula (*R. Saglionis*). Parts terete, slender and mostly long, sometimes to 2 ft. high and terminated by cluster of short branches: fls. pinkish to white with yellowish midrib, about ½ in. or more across. Cent. Brazil to Uruguay.

grandiflora. Branches cylindrical and rather stout, to 3 ft. high and nearly ½ in. diam.: fls. scattered, rose or cream-color, about ¾ in. across. Brazil.

Houlletiana. Much branched, to 6 ft.; branches leaf-like, flat and thin, to 2 in. broad, serrate or notched: fls. cream-color turning yellowish, with red center, about ¾ in. long. Brazil.

mesembryanthoides (often but not originally spelled *mesembryanthemoides*). Upright with drooping ends, branches of two kinds,—some 4–8 in. long and very slender, fruiting branches ¼–nearly ½ in. long and thicker: fls. white or light pink, solitary, ½ in. or more across. Brazil.

pachyptera. Sts. more or less pendent and much jointed; joints to 2 ft. long and nearly 3 in. broad but sometimes nearly orbicular, crenate: fls. yellowish, solitary, about ⅔ in. long. Brazil.

paradoxa. Hanging in clusters to 3 ft. or more, with many aerial roots, branches 3-winged and zigzag: fls. white, about ¾ in. long. Brazil.

pentaptera. Branches stiff and to ½ in. or more diam. and strongly 5- or 6-ribbed to almost winged: fls. scattered, cream-color and petals reddish on back, about ¼–⅓ in. long. S. Brazil, Uruguay.

rhombea. Branches flat and thin or sometimes 3-angled, the joints to 1 in. broad and crenate: fls. solitary or in 2's, cream-color with red spot inside. Brazil.

Saglionis: *R. cereuscula.*

salicornioides: *Hatiora salicornioides.*

RHIZOME: underground stem; rootstock.

RHIZOPHORA. Mangrove. The only representative in the U. S. of *Rhizophoraceæ*, a family of 17 genera of trees and shrubs in trop. and semi-trop. regions about the world; the plants of this family bear thick leathery mostly opposite entire lvs., bisexual and regular polypetalous fls. in axillary clusters, and indehiscent or tardily splitting leathery fr. **R. Mangle,** American M., is native on tidal shores and shoals and in marshes under sea influence and along streams from the Everglades, S. Fla. to W. Indies, Cent. Amer., S. Amer.: tree commonly to 40 ft. high but sometimes twice or more this height, with thick round and bushy top, forming dense and difficult tangles by the many arching aerial roots that become attached in the mud and form stilts or trunks as well as by the seedlings that arise from the seeds that begin to germinate before the frs. fall from the tree. In regions of its nativity the mangrove protects shores and aids in building land, and affords acceptable background for the development of personal properties; it is one of the most interesting of trees.

RHODANTHE: *Helipterum Manglesii.*

RHODIOLA: *Sedum.*

RHODOCHITON. *Scrophulariaceæ.* A graceful vine of free-flowering habit, similar to Maurandia but more vigorous and differing in technical characters; 1 species. It blooms the first season if the seed is sown in early spring, and should be treated as a tender ann. **R. volubile.** Purple Bell-Vine. Lvs. alternate, heart-shaped, to 3 in. long, toothed: fls. purplish-red, over 2 in. long, on red sts., solitary, drooping. Mex.

RHODODENDRON (incl. *Azalea* and *Rhodora*). Rose Bay. Azalea. *Ericaceæ.* Ornamental shrubs with alternate entire lvs., bell-shaped or funnelform fls. mostly in terminal umbel-like racemes, and capsular frs., making prominent autumnal buds. The botanical differences between azaleas and rhododendrons are not constant, but the azaleas are largely deciduous with funnelform fls. and the rhododendrons mostly evergreen with bell-shaped fls.

Rhododendrons do not thrive in clay or limestone soils, but stand best in a mixture of leaf-mold, peat and sandy loam. They should be protected from strong winds and continuous hot sun, and the soil kept moist. Transplanting is easily effected in spring or fall if a good ball of earth is kept around the roots. Most of the species require a mulch as protection from frost. They usually need protection from early spring sun and winds, and are therefore placed where somewhat screened by other plantings.

Rhododendrons and azaleas are propagated by seeds sown in pans or boxes of sandy peat and only slightly covered with sand or sphagnum. Seedlings should be transplanted as soon as they can be handled. The second year they may be taken out. Propagated also by layers which cannot be separated until the second year and slowly by cuttings of half-ripe wood taken with a heel. Named varieties are increased by grafting, particularly veneer-grafting.

Rhododendrons are often forced under glass for the florists' trade. They should be grown in pots and can be brought into bloom in about six weeks with a night temperature of 50–55°.

The varieties and hybrids of *R. catawbiense* are the standard and dependable rhododendrons for planting in the North. Some of the unmodified species also endure northern conditions, particularly if given some protection, as *R. arbutifolium, brachycarpum, campanulatum, carolinianum, caucasicum, dauricum, ferrugineum, hirsutum, Metternichii, micranthum, minus, myrtifolium, Przewalskii, Smirnovi.* The few high northern species are of course very hardy, as *R. lapponicum, maximum, parvifolium.*

As here understood, Rhododendron includes all the azaleas, even though the latter are habitually kept separate by gardeners. The azaleas are commonly assumed to be deciduous, and this is true of the native North American species; but the Indian azaleas and others are evergreen, and some of the rhododendrons are deciduous. Nor is the shape of the corolla or other character a constant mark of separation when the plants of the world are considered. Those who wish to name their plants under Azalea will find the *A* synonym, in the following account, to be the tenable name under that genus. The much-modified garden azaleas are of three main groups: (1) the Indian azaleas (*R. indicum*), evergreen, much grown under glass for florists' trade and in the open along the seaboard and in the South and California; (2) the Ghent azaleas (hybrid derivatives from *R. luteum*, known as *R. gandavense*), deciduous, abounding in yellows, forced and also hardy on the seaboard; (3) the kurume and similar classes (forms of *R. obtusum*), evergreen, not hardy North but popular under glass. Some of the dwarf kinds, or taller species that bloom when small, are useful in rock-gardening.

albiflorum (*A. albiflora*). To 6 ft., deciduous: lvs. to 2½ in. long: fls. white, broad bell-shaped, ¾ in. across, solitary and nodding, June–July. B. C. to Ore. and Colo.

album. Evergreen: lvs. to 4 in. long, rusty beneath: fls. yellowish-white, bell-shaped. Java.

album elegans. Hybrid with *R. catawbiense* as one parent: fls. pale pink changing to white.

ambiguum. Evergreen: lvs. to 3 in. long, scaly beneath: fls. pale yellow spotted with green, 2 in. across. China.

amœnum: *R. obtusum* var.

Anthopogon. To 1 ft., evergreen; lvs. to 1½ in. long, rusty-scaly beneath: fls. yellow, salver-shaped, ½ in. across. Himalayas.

arborescens (*A. arborescens. Azaleastrum arborescens*). To 10 ft. or more, deciduous: lvs. to 3 in. long: fls. white or pinkish, fragrant, funnelform, 2 in. long, June–July; stamens much exserted. Pa. to Ga. and Ala.

arboreum. To 40 ft., evergreen: lvs. to 7 in. long, white- or rusty-tomentose beneath: fls. red, pink or white and often spotted, bell-shaped, to 1½ in. across, Mar.–May. Himalayas. Var. **nilagiricum** has rose or crimson spotted fls.

arbutifolium (*R. daphnoides*). Hybrid between *R. ferrugineum* and *R. minus:* to 4 ft., evergreen: lvs. to 3 in. long, scaly beneath: fls. pink, bell-shaped, to ¾ in. across. June–July.

argenteum: *R. grande.*

atlanticum (*A. atlantica*). To 2 ft., deciduous: lvs. to 2½ in. long: fls. white or pinkish, funnelform, 1 in. long, Apr.–May; stamens much exserted. Del. to S. C.

Aucklandii: *R. Griffithianum* var.

Augustini. To 20 ft., evergreen: lvs. to 3 in. long, scaly beneath: fls. pink spotted with yellow, broad bell-shaped, to 2 in. across, Apr.–May. China.

aureum: *R. chrysanthum.*

auriculatum. To 20 ft., evergreen: lvs. to 1 ft. long, rusty-tomentose beneath: fls. white or pinkish spotted with green or rose, broad-funnelform, to 3½ in. across, Aug. China.

austrinum (*A. austrina*). To 10 ft., deciduous: lvs. to 3½ in. long, pubescent: fls. yellow or orange, funnelform, to 1¼ in. long, early spring; stamens much exserted. Fla.

azaleoides (*R. ordoratum*). Hybrid between *R. ponticum* and probably *R. nudiflorum:* fls. pale purple, to 2 in. across.

barbatum. Tree to 60 ft., evergreen: lvs. to 7 in. long, the petioles bristly: fls. deep red, bell-shaped, 1½ in. across, Apr. Himalayas.

Blandianum. A hybrid with *R. catawbiense* as one parent: fls. rosy-crimson.

Boothii. To 6 ft., evergreen, often epiphytic: lvs. to 5 in. long: fls. yellow, bell-shaped, 1¼ in. across. Himalayas.

brachyanthum. Dwarf shrub: lvs. scaly and glaucous beneath: fls. sulfur-yellow, broad bell-shaped, ½ in. long. China.

brachycarpum. To 12 ft., evergreen: lvs. to 8 in. long, gray-tomentose beneath: fls. white or yellowish striped with pink, funnelform, 2 in. across, June. Japan, Korea. Var. **rosæflorum** has pink fls.

brevistylum. Evergreen: lvs. to 3 in. long, white-scaly: fls. pink, bell-shaped, ¾ in. long, scaly outside. China.

bullatum. To 5 ft., evergreen: lvs. to 3 in. long, brown-tomentose beneath, wrinkled above: fls. white spotted with yellow, fragrant, bell-shaped, 2 in. across. China.

Bylsianum. A reputed hybrid.

calendulaceum (*A. calendulacea. A. lutea,* in part). Flame Azalea. To 10 ft. or more, deciduous: lvs. to 3 in. long, pubescent when young: fls. orange-yellow to scarlet, funnelform, 2 in. across, May–June; stamens much exserted. Pa. to Ga. and Ky.

californicum (*R. washingtonianum*). To 10 ft. or more, evergreen: lvs. to 6 in. long: fls. rosy-purple spotted with brown, bell-shaped, to 2½ in. across, May–June. B. C. to Calif.

calophyllum. To 3 ft., evergreen: lvs. to 5 in. long, scaly beneath: fls. white tinged yellowish-green, tubular-bell-shaped, 3 in. across. Himalayas.

calophytum. Tree to 40 ft., evergreen: lvs. oblong, to 1 ft. long: fls. white to rose, broad bell-shaped, 2 in. across. China.

calostrotum. Dwarf evergreen, suitable for rock-garden: lvs. oval or elliptic, nearly or about 1 in. long with petiole fully as long, reddish and scaly underneath: fls. solitary or in pairs, open, rose-purple, the corolla nearly 1 in. long. Burma.

campylocarpum. To 6 ft., evergreen: lvs. to 3½ in. long. glaucous beneath: fls. yellow, fragrant, bell-shaped, to 2½ in. across. Himalayas.

canadense (*Rhodora canadensis*). Rhodora. To 3 ft., much branched, deciduous: lvs. about 2 in. long, gray- pubescent beneath: fls. rose-purple, 2-lipped, to ¾ in. long, Apr.–May. Newf. to Pa.

candidissimum. A reputed hybrid.

canescens (*A. canescens*). To 15 ft., deciduous: lvs. to 4 in. long, gray-tomentose beneath: fls. pink or white, funnelform, 1½ in. across, Apr.; stamens much exserted. N. C. to Fla. and Tex.

carolinianum. To 6 ft., evergreen: lvs. to 3 in. long, rusty-scaly beneath: fls. pale rose-purple to white, bell-shaped, to 1½ in. across, May–June. N. C. Var. **album** has white fls.

Cartonianum. Reputed hybrid: fls. violet, white toward base.

catawbiense. MOUNTAIN ROSE BAY. To 20 ft., evergreen: lvs. to 5 in. long, shining above, pale beneath: fls. lilac-purple, broad bell-shaped, to 2½ in. across, May–June. Mts., Va. to Ga. Var. **album** has white fls.

caucasicum. To 2 ft., evergreen: lvs. to 4 in. long, brown-tomentose beneath: fls. pink or yellowish-white spotted with green, narrow bell-shaped, 2 in. across, May. Caucasus.

Chamæcistus: *Rhodothamnus Chamæcistus.*

chartophyllum. To 3 ft., evergreen: lvs. to 3½ in. long, scaly beneath: fls. pale pink, spotted, narrow bell-shaped, 2 in. across. China.

chrysanthum (*R. aureum*). To 3 ft., much branched, evergreen: lvs. to 3 in. long: fls. pale yellow, narrow bell-shaped, 1 in. across, May–June. Siberia to Japan.

chryseum. Dwarf much branched shrub, evergreen: lvs. ½ in. long, covered beneath with brown and pale green scales: fls. yellow, broad-funnelform, ½ in. long, scaly. China.

ciliatum. To 4 ft., evergreen: lvs. to 4 in. long, hairy above, scaly beneath: fls. pale purple, bell-shaped, 1½ in. across, early spring. Himalayas.

cinnabarinum. To 10 ft., evergreen: lvs. to 4 in. long, scaly beneath: fls. brick-red, tubular-bell-shaped, to 2 in. long, May–June. Himalayas.

concinnum. To 10 ft., evergreen: lvs. to 2½ in. long, scaly: fls. purple, bell-shaped, 1½ in. across, May. China.

crassum. To 8 ft., evergreen: lvs. to 7 in. long, rusty-scaly beneath: fls. white, funnelform, to 4 in. across. Himalayas.

dahuricum: *R. dauricum.*

Dalhousiæ. To 8 ft., evergreen, often epiphytic: lvs. to 5 in. long, rusty-scaly beneath: fls. yellow to white, fragrant, bell-shaped, 4½ in. across. Himalayas.

daphnoides: *R. arbutifolium.*

dauricum (*R. dahuricum*). To 6 ft., deciduous or semi-evergreen: lvs. to 2 in. long, scaly beneath: fls. rosy-purple, broad bell-shaped, to 1½ in. across, solitary, Mar.–Apr. Siberia to Japan. Var. **mucronulatum** (*R. mucronulatum*) has deciduous lvs. and paler fls. Var. **sempervirens** (var. *atrovirens*) has dark green evergreen lvs.

Davidsonianum. To 10 ft., evergreen: lvs. to 2½ in. long, scaly and glaucous beneath: fls. pink, narrow bell-shaped, to 1¼ in. across, May; stamens slightly exserted. China.

decorum. Evergreen: lvs. to 5 in. long, glaucous beneath: fls. white or pink, broad bell-shaped, 2 in. across. China.

Delavayi. Tree, evergreen: lvs. rusty-tomentose beneath: fls. deep red, broad bell-shaped, 1 in. across. China.

delicatissimum. A *catawbiense* hybrid with pale pink fls. changing to white.

dichroanthum. To 7 ft. or less, evergreen, but blooming when small: lvs. oblong to oblanceolate or obovate, to 3 in. long, whitish underneath: fls. 2–5 together, yellowish-rose to orange, corolla fleshy and to 1 in. across. Yunnan, China.

discolor. To 15 ft., evergreen: lvs. to 8 in. long, pale beneath: fls. white or pale pink, narrow bell-shaped, to 3 in. across, June. China.

Edgeworthii. Shrub to 6 ft., often epiphytic: lvs. to 4 in. long, rusty-tomentose beneath, dark green above: fls. white tinged with rose, broad bell-shaped, to 4½ in. across. Himalayas.

Everestianum. A *catawbiense* hybrid with rosy-lilac fls. having crisped edges.

eximium: *R. Falconeri* var.

Faberi. To 18 ft., evergreen: lvs. to 6 in. long, rusty-tomentose beneath: fls. white or pink spotted with red, broad bell-shaped, 1½ in. across. China.

Falconeri. To 30 ft., evergreen: lvs. to 10 in. long, rusty-tomentose beneath: fls. white spotted with purple, fragrant, bell-shaped, 2 in. across, in spring. Himalayas. Var. **eximium** (*R. eximium*), fls. rose, not spotted.

Fargesii. To 15 ft., evergreen: lvs. to 3 in. long, glaucous beneath: fls. white or pink, broad bell-shaped, to 2 in. across, May. China.

fastigiatum. Very dwarf, evergreen: lvs. to ½ in. long, rusty-scaly: fls. lilac-rose, to 1 in. across. China. See *R. impeditum.*

fastuosum flore-pleno. A hybrid between *R. catawbiense* and *R. ponticum:* fls. lilac-purple, semi-double.

ferrugineum. To 3 ft., evergreen: lvs. to 2 in. long, shining above, rusty-scaly beneath: fls. pink to carmine, funnelform, ½ in. across, July–Aug. Mts. of Cent. Eu.

fictolacteum. To 20 ft., evergreen: lvs. to 8 in. long, rusty-tomentose beneath: fls. white spotted with red, bell-shaped, 2 in. across. China.

flavidum (*R. primulinum*). To 3 ft., evergreen: lvs. oblong-ovate, to about ¾ in. long, scaly, darker above: fls. few together, yellow, about 1 in. across. W. China.

flavum: *R. luteum.*

floribundum. To 15 ft., evergreen: lvs. to 5 in. long, gray-tomentose beneath: fls. rose, 1½ in. across. China.

formosum. To 8 ft., evergreen: lvs. to 2½ in. long, scaly and glaucous beneath: fls. white or pinkish, narrow bell-shaped, to 2 in. across. Himalayas.

Forsterianum. Hybrid between *R. Edgeworthii* and *R. Veitchianum:* fls. white.

Fortunei. To 12 ft., evergreen: lvs. to 8 in. long, pale beneath: fls. lilac or pink, fragrant, broad bell-shaped, to 3 in. across, May–June. China.

fragrantissimum. Hybrid probably between *R. ciliatum* and *R. Edgeworthii:* fls. white or pinkish, fragrant.

Fraseri. Hybrid between *R. japonicum* and *R. canadense:* fls. rose-lilac, 2-lipped, to 1½ in. across.

fulgens. To 12 ft., evergreen: lvs. to 4 in. long, rusty-tomentose beneath: fls. blood-red, bell-shaped, to 1¼ in. across, in spring. Himalayas.

gandavense. GHENT AZALEAS. A series of hybrids between *R. luteum* and other species, probably *R. calendulaceum* and *R. nudiflorum.*

giganteum. A *catawbiense* hybrid with bright rose fls.

glaucum. To 3 ft., evergreen: lvs. to 3 in. long, scaly, glaucous beneath: fls. rose, bell-shaped, 1¼ in. across, in spring. Himalayas.

grande (*R. argenteum*). Tree to 40 ft., evergreen: lvs. to 1 ft. long, white beneath: fls. rosy to white, bell-shaped, to 3 in. across. Himalayas.

Griersonianum. To 6 ft., evergreen: lvs to 7 in. long, with a red horny tip, rusty-tomentose beneath: fls. rose with darker spots, 2½ in. long. China.

Griffithianum. To 8 ft.: lvs. to 1 ft. long: fls. white, fragrant, 3 in. across, bell-shaped. Himalayas. Var. **Aucklandii** has fls. to 7 in. across.

hæmatodes. Evergreen: lvs. rusty-tomentose beneath: fls. red, broad bell-shaped, 1 in. across. China.

Hanceanum. To 3 ft., evergreen: lvs. to 3 in. long, scaly: fls. yellow to white, narrow bell-shaped, ¾ in. across, in spring; stamens exserted. China.

hedyosmum. To 1 ft., much branched, evergreen: lvs. to 1 in. long, rusty-scaly beneath: fls. waxy-white, funnelform, about 1 in. long. China.

Hinodegiri. One of the Kurume azaleas, *R. obtusum* var.

hippophaeoides. To 5 ft., much branched, evergreen: lvs. to 1¼ in. long, pubescent: fls. lavender-blue, bell-shaped, ½ in. long. China.

hirsutum. To 3 ft., evergreen: lvs. to 1¼ in. long, scaly beneath, ciliate: fls. pink to carmine, funnelform, ½ in. across, June. Mts. of Eu.

Hodgsonii. To 20 ft., evergreen: lvs. to 1 ft. or more long, rusty-tomentose beneath: fls. pale purple, broad bell-shaped, 2 in. across. Himalayas.

impeditum. To 20 in. and small-lvd., evergreen: lvs. elliptic and obtuse, less than ½ in. long, papillate and somewhat glaucous underneath: fls. in terminal umbels, light purplish-blue. Yunnan, China.—Sometimes misnamed *R. fastigiatum*, which differs in its hoary rather than dull green appearance and fls. lepidote or scaly outside.

indicum (*A. indica. R. macranthum*). To 6 ft., evergreen: lvs. to 3 in. long, pale beneath: fls. red or pink, broad-funnelform, to 3 in. across, usually solitary, June–July. Japan. Var. **balsaminæflorum** (var. *rosæflorum*), fls. salmon-red, double. Var. **lateritium**, fls. salmon- or brick-red.

intricatum. To 1½ ft., evergreen: lvs. ½ in. long, scaly: fls. violet-purple, broad-funnelform, ½ in. across, June. China.

irroratum. Evergreen: lvs. to 4 in. long, pale beneath: fls. white or pinkish, narrow bell-shaped, 1½ in. long. China.

japonicum (*A. japonica*). To 6 ft., deciduous: lvs. to 4 in. long, ciliate: fls. orange-red to scarlet, narrow bell-shaped, to 2½ in. across, Apr.–June. Japan.

javanicum. Epiphytic shrub, evergreen: lvs. to 5½ in. long: fls. red, bell-shaped, 1½ in. long. Mts., Malaya.

Kaempferi: *R. obtusum* var.

kamtschaticum (*Therorhodion camtschaticum*). To 1 ft., deciduous: lvs. to 2½ in. long, ciliate: fls. rose-purple, rotate-bell-shaped, to 1½ in. across, July–Aug. Alaska to B. C.

kiusianum: *R. obtusum* var. *japonicum*.

Kosterianum. Hybrid between *R. japonicum* and *R. molle:* fls. white to red.

Kurume azaleas: *R. obtusum* var. *amœnum*.

lætevirens (*R. Wilsoni. R. oleæfolium*). Hybrid between *R. carolinianum* and *R. ferrugineum:* fls. rose, 1¼ in. across.

lanatum. Evergreen: lvs. to 5 in. long, densely tomentose beneath: fls. yellow spotted with red, bell-shaped, to 2½ in. across. Himalayas.

lapponicum. To 1½ ft. or prostrate, evergreen: lvs. to ¾ in. long, rusty-scaly beneath: fls. purple, broad bell-shaped, ½ in. across, June–July. Mts. of N. Eu., N. Asia, N. Amer.

lateritium: *R. indicum* var.

ledifolium: *R. mucronatum.*

lepidotum. To 4 ft., evergreen: lvs. to 1½ in. long, scaly: fls. purple, broad bell-shaped, ½ in. across. Himalayas.

linearifolium (*A. linearifolia*). To 4 ft., evergreen: lvs. linear-lanceolate, to 3 in. long: fls. rose-lilac, deeply divided into linear segms. Japan.

Loderi. Hybrid between *R. Fortunei* and *R. Griffithianum:* fls. white to rose, fragrant, to 6 in. across.

longistylum. To 6 ft., evergreen: lvs. to 2 in. long, scaly beneath: fls. white, narrow bell-shaped, ½ in. across, style exserted. China.

lutescens. To 6 ft., evergreen: lvs. to 3 in. long, scaly beneath: fls. yellow, broad funnelform, 1 in. across, in spring; stamens exserted. China.

luteum (*R. flavum. A. pontica*). To 12 ft., deciduous: lvs. to 5 in. long, hairy when young: fls. yellow, very fragrant, funnelform, 2 in. across, May; stamens much exserted. Caucasus.—Parent of the race of Ghent azaleas; see *R. gandavense.*

macranthum: *R. indicum.*

Maddenii. To 8 ft., evergreen: lvs. to 6 in. long, scaly beneath: fls. white, funnelform, to 4 in. across. Himalayas.

malvaticum: hort. name.

Manglesii. Hybrid between *R. Griffithianum* and *R. album elegans:* fls. white, spotted.

maximum. Tree or shrub to 35 ft., evergreen: lvs. to 10 in. long, tomentose beneath: fls. rose spotted with green, bell-shaped, to 1½ in. across, June-July. N. S. to Ga. and Ala. Color forms are vars. **album, purpureum, roseum.**

Maxwellii. Shrub or tree, often epiphytic, evergreen: lvs. to 8 in. long: fls. yellow, funnelform, 1 in. long; stamens slightly exserted. Borneo.

Metternichii. To 12 ft., evergreen: lvs. to 5 in. long, tomentose beneath: fls. rose, bell-shaped, to 3 in. across, Apr.–May. Japan.

micranthum. To 8 ft., evergreen: lvs. to 1½ in. long, rusty-scaly beneath: fls. white, bell-shaped, ½ in. across, June–July; stamens exserted. China.

minus (*R. punctatum*). To 10 ft., evergreen: lvs. to 4 in. long, scaly beneath: fls. pink spotted with green, funnelform, 1¼ in. across, June–July. S. C. to Ga. and Ala.

molle (*R. sinense. A. mollis*). To 5 ft., deciduous: lvs. to 6 in. long, gray-pubescent beneath: fls. golden-yellow, broad funnelform, 2 in. across, Apr.–May. China.

Mortieri. Hybrid between *R. calendulaceum* and *R. nudiflorum:* fls. pinkish spotted with orange.

mucronatum (*R. ledifolium* and var. *album. A. mucronata*). To 6 ft., evergreen: lvs. to 3 in. long, tomentose: fls. white, fragrant, broad funnelform, 2 in. across, May. China. Var. **narcissiflorum**, fls. white, double.

mucronulatum: *R. dauricum* var.

myrtifolium. Hybrid between *R. hirsutum* and *R. minus:* to 5 ft., evergreen: lvs. to 2½ in. long, rusty-scaly beneath: fls. pink, funnelform, 1 in. across, June–July.

neriifolium. Epiphytic shrub: lvs. linear-lanceolate, to 3 in. long, scaly: fls. rose or purple, funnelform, 1½ in. long, usually solitary. New Guinea.

norbitonense. Hybrid with *R. molle* as one parent: fls. yellow. Var. **aureum** (*R. Smithii aureum*) has lvs. glaucous beneath.

nudiflorum (*A. nudiflora*). PINXTER-FLOWER. To 6 ft. or more, deciduous: lvs. to 3 in. long, glabrous and green underneath or hairy on the midrib: fls. pink to nearly white, funnelform, 1½ in. across, Apr.–May; stamens exserted. Me. to Fla. and Tex. Var. **roseum** (*R. roseum, A. rosea*) has under side of lvs. and also shoots grayish-pubescent; similar range but more inland.

obtusum (*A. obtusa*). To 3 ft., much branched, evergreen: lvs. to 1 in. long, shining above: fls. red, funnelform, to 1½ in. across, Apr.–May. Japan. Var. **amœnum** (*R. amœnum*), fls. purple or magenta, about 1 in. across, hose-in-hose. Here belong most of the "Kurume" azaleas. Var. **Arnoldianum** is a hybrid between vars. *amœnum* and *Kaempferi* with rose to red fls. Var. **japonicum** (*R. kiusianum*) has two forms of lvs. at different seasons, fls. 2–5, the wild or spontaneous form. Var. **Kaempferi** (*R. Kaempferi*). Often deciduous, summer lvs. somewhat different: fls. red to pink, 2–4, 2 in. across.—The Kurume and Hinodegiri azaleas are products of *R. obtusum*, the former particularly of var. *amœnum* and the latter of var. *japonicum.*

occidentale (*A. occidentalis*). To 10 ft., deciduous: lvs. to 4 in. long, ciliate: fls. white or pink with yellow blotch, funnelform, to 2 in. across, June–July; stamens exserted. Ore., Calif.

odoratum: *R. azaleoides.*

Oldhamii (*A. Oldhamii*). Much branched evergreen, to 10 ft., very glandular and hairy: lvs. elliptic or lanceolate to nearly ovate, to 3 in. long: fls. red, to 2 in. across the spreading rounded lobes. Japan.

oleæfolium: *R. lætevirens.*

oreotrephes. To 25 ft., evergreen: lvs. to 2 in. long, scaly beneath: fls. rose-lavender, broad funnelform, to 1½ in. long; stamens exserted. China.

ovatum. Evergreen: lvs. to 2½ in. long, shining above: fls. pale purple to pink, spotted, 1 in. across, May–June. China.

parvifolium. To 5 ft., evergreen: lvs. to ¾ in. long, scaly: fls. rose-purple, broad bell-shaped, to ¾ in. across, Apr.–May. Siberia, Korea.

pentaphyllum. To 25 ft., deciduous: lvs. to 2½ in. long: fls. rose, broad bell-shaped, 2 in. across, Apr.–May. Japan.

phœniceum: *R. pulchrum* var.

planetum. Evergreen: lvs. to 1 in. long, with reddish midrib: fls. pink, narrow bell-shaped, to 2 in. long. China.

polylepis. To 10 ft., evergreen: lvs. to 3 in. long, scaly beneath: fls. purple spotted with yellow, to 2 in. across; stamens exserted. China.

ponticum. To 10 ft., evergreen: lvs. to 6 in. long, pale beneath: fls. purple spotted with brown, narrow bell-shaped, 2 in. across, May–June. Spain, Portugal, Asia Minor.

poukhanense: *R. yedoense* var.

præcox. Hybrid between *R. dauricum* and *R. ciliatum:* lvs. to 2 in. long, rusty-scaly beneath: fls. rose-purple, broad funnelform, 1½ in. across, Mar.–Apr.

primulinum: *R. flavidum.*

prunifolium. To 10 ft., deciduous: lvs. to 5 in. long, pale beneath: fls. crimson, funnelform, 1 in. long; stamens much exserted. Ga. to Ala.

Przewalskii. Evergreen: lvs. to 4 in. long, brown-tomentose beneath: fls. white or pink spotted with purple, bell-shaped, to 1½ in. across. China.

pulchrum. Possibly a hybrid between *R. scabrum* and *R. mucronatum:* fls. rose-purple, to 3 in. across. Var. **phœniceum** (*R. phœniceum*) has purple to magenta fls.

punctatum: *R. minus;* also applied to a garden hybrid.

quinquefolium. To 25 ft., deciduous: lvs. to 2 in. long, ciliate: fls. white spotted with green, broad bell-shaped, 1½ in. across, May. Japan.

racemosum. To 6 ft., evergreen: lvs. to 1½ in. long, scaly and glaucous beneath: fls. pink, broad bell-shaped, ¾ in. across, Apr.–May; stamens exserted. China.

radians. Shrub: lvs. in whorls of 5–12, cordate-ovate or oval, to 2 in. long, slightly scaly beneath: fls. white, salverform, to 3 in. long, slightly scaly outside. Celebes.

radicans. Prostrate and matted, evergreen, to 8 in. high, mentioned in rock-gardening: lvs. thick, narrow-oblong to somewhat obovate, about ½ in. long, shining above, grayish underneath: fls. solitary and terminal, dark purple, corolla about ½ in. long. Tibet.

reticulatum (*R. rhombicum. A. reticulata*). To 25 ft., deciduous: lvs. ovate, to 2½ in. long: fls. rose-purple, broad bell-shaped, to 2 in. across, Apr.–May. Japan.

rhombicum: *R. reticulatum.*

Ririei. To 18 ft., evergreen: lvs. to 6 in. long, pale beneath: fls. purple with black spots, broad bell-shaped, 2 in. across. China.

roseum: *R. nudiflorum* var.; sometimes considered to be a separate species.

roseum elegans and **roseum superbum** are *catawbiense* hybrids with lilac and rose-purple fls.

rubiginosum. To 3 ft., evergreen: lvs. to 3 in. long, rusty-scaly beneath: fls. rose, broad funnelform, 1½ in. across, Apr.–May. China.

russatum. To 3 ft., evergreen: lvs. oblong to oval, to 1 in. long, russet-brown underneath: fls. in head-like umbels, deep purple-blue. Yunnan, China.

Sanderi. Hybrid between *R. obtusum* and *R. Simsii.*

scabrum (*R. sublanceolatum*). To 6 ft., evergreen: lvs. to 4 in. long: fls. rose to scarlet, funnelform, 2½ in. across. Japan.

Schlippenbachii (*A. Schlippenbachii*). To 15 ft., deciduous: lvs. to 5 in. long, pale beneath: fls. pink spotted with brown, fragrant, broad funnelform, to 3 in. across, May. Korea, Manchuria, Japan.

serrulatum (*A. serrulata*). To 25 ft., deciduous: lvs. to 3 in. long, ciliate: fls. white, fragrant, funnelform, 1½ in. long; stamens exserted. Ga. to Fla. and La.

shweliense. To 3 ft., evergreen: lvs. to 2 in. long, scaly above, grayish-white below: fls. greenish-yellow, bell-shaped, ½ in. long. China.

Simsii. To 10 ft., semi-evergreen: lvs. to 2 in. long, hairy: fls. rose to red, broad funnelform, to 2 in. across, May–June. China, Formosa. Var. **vittatum** (*R. vittatum*), fls. white striped with lilac-purple.

sinense: *R. molle.*

sino-grande. To 30 ft., evergreen: lvs. to 1½ ft. long, white-pubescent beneath: fls. white, bell-shaped, 2 in. long. Mts., China.

sinolepidotum. To 1½ ft., much branched, evergreen: lvs. to 1 in. long, scaly: fls. deep rose, white-scaly outside, ½ in. long. China.

sinonuttallii. To 10 ft., evergreen: lvs. to 8 in. long: fls. pink tinged with yellow, fragrant, bell-shaped, to 5 in. across. China.

Smirnovi. To 18 ft., evergreen: lvs. to 6 in. long, brown-tomentose beneath: fls. rose, narrow bell-shaped, to 3 in. across, May. Caucasus.

Smithii. Hybrid between *R. ponticum* and *R. arboreum:* fls. rose-purple.

Souliei. To 10 ft., evergreen: lvs. to 3 in. long: fls. pink or white, cup-shaped, to 3 in. across, May–June. China.

speciosum (*A. speciosa*). To 6 ft., deciduous: lvs. to 2½ in. long, pubescent beneath: fls. red with yellow spot, funnelform, to 2 in. across, May; stamens much exserted. S. C. to Ga.

spinuliferum. To 8 ft., evergreen: lvs. to 1¾ in. long, scaly beneath: fls. red, funnelform, 1 in. long; stamens exserted. China.

strigillosum. To 20 ft., evergreen: lvs. to 5½ in. long, brown-hairy beneath: fls. red or white, bell-shaped, 1½ in. across. China.

sublanceolatum: *R. scabrum.*

sutchuenense. To 15 ft., evergreen: lvs. to 10 in. long: fls. pink or lilac spotted with purple, narrow bell-shaped, to 2½ in. across. China.

taliense. To 10 ft., evergreen: lvs. to 5 in. long, rusty-tomentose beneath: fls. white to pink, narrow bell-shaped, 1 in. across. China.

tephropeplum. Evergreen: lvs. to 2½ in. long, scaly beneath: fls. rose, broad funnelform, 1 in. long. China.

Thomsonii. To 12 ft., evergreen: lvs. to 4 in. long, glaucous beneath: fls. blood-red, bell-shaped, to 3 in. across, in early spring. Himalayas.

Tschonoskii (*A. Tschonoskii*). To 8 ft., much branched, deciduous: lvs. to 1 in. long, pubescent: fls. white, funnelform, ½ in. across, June; stamens exserted. Japan, Korea.

Ungerni. To 20 ft., evergreen: lvs. to 6 in. long, brown-tomentose beneath: fls. pink to white, broad bell-shaped, 2 in. across. Caucasus.

Vaseyi (*A. Vaseyi. Biltia Vaseyi*). To 15 ft., deciduous: lvs. to 5 in. long: fls. rose spotted with brown, 2-lipped, 1½ in. across, Apr.–May; stamens exserted. N. C.

Veitchianum. To 6 ft., evergreen: lvs. to 4 in. long, scaly and glaucous beneath: fls. white, broad funnelform, 5 in. across. Himalayas.

Vervæneana. A hybrid Indian azalea with rose fls. bordered with white. Var. **alba** has white fls.

viscosum (*A. viscosa*). WHITE SWAMP HONEYSUCKLE. To 10 ft. or more, deciduous: lvs. to 2½ in. long: fls. white or pink, fragrant, funnelform, to 2 in. long, June–July; stamens exserted. Swamps Me. to S. C. Var. **glaucum**, lvs. glaucous beneath.

vittatum: *R. Simsii* var.

washingtonianum: *R. californicum.*

wellesleyanum. Hybrid between *R. catawbiense* and *R. maximum:* fls. white or pinkish.

Wightii. To 14 ft., evergreen: lvs. to 8 in. long, rusty-tomentose beneath: fls. yellow spotted with red, bell-shaped, 2½ in. across. Himalayas.

Williamsianum. Slender-branched evergreen: lvs. ovate or broader, mostly subcordate, to nearly 2 in. long, glabrous: fls. 3–5 together, pale rose. W. China.

Wilsoni: *R. lætevirens.*

yanthinum. To 10 ft., evergreen: lvs. to 2½ in. long, scaly beneath: fls. rose-purple spotted with brown, narrow bell-shaped, 2 in. across, June. China.

yedoense (*A. yodogava*). Deciduous or semi-evergreen: lvs. to 3 in. long, pale and hairy beneath: fls. rose-lilac spotted with purple, double, May. Korea, Japan. Var. **poukhanense** (*R. poukhanense*). To 6 ft.: fls. fragrant, 2 in. across.

yodogava or **yodogawa** is a synonym of *R. yedoense.*

yunnanense. To 6 ft., semi-evergreen: lvs. to 3 in. long, scaly: fls. white or pinkish spotted with red, broad funnelform, 2 in. across, May; stamens exserted. China.

zaleucum. Tree to 30 ft., evergreen: lvs. to 3 in. long, gray-scaly beneath: fls. white or pinkish, funnelform, 1½ in. long. China.

RHODOMYRTUS. *Myrtaceæ.* A few trees and shrubs, trop. Asia to Australia, with opposite simple lvs., rather large pink or white fls., and fr. a berry; grown for the edible fr.

The following species will withstand several degrees of frost and is not particular as to soil. Propagated by seeds which should be sown in flats.

tomentosa. Downy-Myrtle. Hill-Gooseberry. To 5 ft.: lvs. to 2½ in. long, densely tomentose beneath, 3-nerved from base: fls. rose-pink, ¾ in. across: fr. ½ in. across, purple. Japan, China, Philippines.

RHODORA: *Rhododendron canadense.*

RHODORHIZA: *Convolvulus floridus.*

RHODOSTACHYS. *Bromeliaceæ.* Short-stemmed S. American herbs with stiff, linear, spiny-toothed lvs. and sessile fls. in heads; suitable for cult. in a warm greenhouse.

andina. Lvs. to 1 ft. long and 1 in. wide: fls. rose, 1 in. long, the bracts about length of fls. Chile.

RHODOTHAMNUS. *Ericaceæ.* One evergreen much branched shrub about 1 ft. high suitable for rock-gardens. It does best in peaty moist soil in partial shade. Propagated by seeds, layers and cuttings of ripe wood. **R. Chamæcistus** (*Rhododendron Chamæcistus*). Lvs. to ½ in. long, entire, ciliate: fls. purple, 1 in. across, usually solitary, May–June. Alps of Eu., E. Siberia.

RHODOTYPOS. *Rosaceæ.* One deciduous shrub to 6 ft., native in Japan and China and now much planted for ornament. **R. tetrapetala** (*R. kerrioides*). Jetbead. Lvs. opposite, ovate or oblong-ovate, to 4 in. long, doubly toothed: fls. white, to 2 in. across, solitary, May–June: fr. a shining black drupe about ¼ in. across.—Hardy in N. Y. and New England and of easy cult. Propagated by seeds and cuttings. The generic name has recently been written *Rhodotypus*, but the author of the name used the Greek form *-os*. By some authors the specific name *scandens* is brought over from Thunberg's *Corchorus scandens*, 1793, supposed to be identical with our plant; but Thunberg described, under that name, a climbing plant with yellow fls., perhaps an error, and the name may lead to confusion when applied to Rhodotypos.

RHŒO. *Commelinaceæ.* One per. herb from W. Indies and Mex., grown in greenhouses and in the open in S. Fla., where it is also naturalized. **R. discolor** (*Tradescantia discolor* and *versicolor*). Sts. to 8 in. long: lvs. to 1 ft. long and 3 in. wide, dark green above, purple below, making an attractive erect-spreading foliage clump: fls. white, in dense umbels nearly concealed by 2 boat-shaped bracts. Var. vittata is striped above lengthwise with pale yellow.

RHOMBOPHYLLUM. *Aizoaceæ.* Segregate from Mesembryanthemum (which see for cult.), marked by oblique-rhomboidal white-flecked lvs. and thread-like stigmas. **R. rhomboideum** (*M. rhomboideum*) is a stemless per. with 8–10 broadly rhomboidal white-dotted green lvs. to 2 in. long and ¾ in. broad: fls. yellow, in 3's on a scape, the petals little exceeding calyx. S. Afr.

RHOPALOSTYLIS (*Eora*). *Palmaceæ.* Unarmed ringed monœcious feather-palms bearing infl. at summit of trunk and base of lvs., and with sheathing petiole-base, native in the New Zeal. region, all the species being accounted for herewith: crown rather narrow because of the upward or feather-duster habit of the lvs.: pinnæ with 1 strong rib either side the midrib: spadix short, stout, much branched; fls. in 3's, pistillate one in middle; stamens 6: fr. ellipsoid, ovoid-oblong or globose, ½ in. or less long, with fleshy exterior; seed 1. For cult. see *Palm.*

Baueri: see *R. sapida.*

Cheesemanii: see *R. sapida.*

sapida (*Areca, Kentia* and *Eora sapida*). Nikau Palm. Erect clean-looking tree to 20 or 25 ft., trunk 6–9 in. diam.: lvs. to 8 ft.; rachis scaly; pinnæ numerous, 2–3 ft. or more, 1–2 in. broad: spadix 12–16 in. or less long; fls. purplish: fr. ovoid or ovoid-ellipsoid, about ½ in. long and ⅜ in. or less diam., red at maturity; seed ovoid, with light colored polished surface and broad-linear hilum: fruiting perianth cup-like. New Zeal.—Thrives and fruits in S. Calif., the spadices sometimes appearing only 2 ft. above the ground; probably the only species planted in the U. S. **R. Baueri.** Tall palm, probably reaching twice or more the height of *R. sapida:* spadix to 3 ft. long: fr. ovoid-ellipsoid, ⅝ in. long and ½ in. diam., seed with dull brown surface, and hilum linear and slightly narrowing toward base: fruiting perianth cup-like. Norfolk Isl. **R. Cheesemanii** of the Kermadec Isls. (north of New Zeal. proper), was formerly confused with *R. Baueri:* tall, to 60 ft.: spadix in fr. about 1½ ft. diam.: fr. globose, ½ in. or less diam.; seed with light colored polished surface, the hilum broad and suborbicular above and narrowing toward base: fruiting perianth wide-spreading rather than cup-like. Another species has been proposed but without diagnosis, *Eora ultima*, for the Chatham Isl. palm commonly referred to *R. sapida.*

RHUBARB (*Rheum Rhaponticum*). Strong hardy Old World perennial grown for the thick leaf-stalks that are cooked and eaten in early spring for their agreeable acid; known also as pie-plant.

Rhubarb thrives on any good garden land. As large leaf-stalks in abundance are wanted, the land should be rich and kept moist. Poor soil should be made fertile by spading out at least 3 feet of the surface, filling with well-rotted manure to within 1 foot of the level, throwing in the top soil and setting the roots with the crowns 4 inches below the surface, firming them with the feet. The stalks should not be cut for use until the second year. Coarse manure should be thrown over the crowns in autumn, to be forked or spaded in lightly when spring opens. Tillage should be maintained after the cutting season is past, for on the strength of the roots will depend the crop the succeeding spring. If given good care and well manured, the plants live for years and yield abundantly. Twenty good roots will supply a large family.

The plant is usually propagated by division of the fleshy roots, small pieces of which will grow if separated from the old established roots and planted in rich mellow soil, every piece having a good eye. The division is usually made in spring and the plants are set 4 or 5 feet apart either way.

Rhubarb may be forced for winter and very early spring, either by placing a temporary glass structure over rows in the field or by digging the roots in autumn and growing them in the cellar or under a greenhouse bench. For the latter kind of forcing strong roots are employed, allowed to freeze after digging, then planted in position with earth underneath them and over them in a room or space with diffused light and a temperature 50 to 75°. After forcing the roots are usually discarded.

RHUBARB, SPINACH-: *Rumex abyssinicus.*

RHUS. Sumac. *Anacardiaceæ.* About 155 species of woody plants native to temp. and subtrop. regions, with milky or resinous juice, simple or compound lvs., small polygamous fls. borne in panicles, 5 stamens, and small 1-seeded drupaceous fr.; grown for ornament; some of them yield tannin. The poison oak or sumac is *R. Vernix* (*R. venenata*), erect shrub or small tree in swamps, E. U. S., and *E. diversiloba* on Pacific coast. The poison ivies are low shrubs or root-climbers, *R. Toxicodendron* and *R. quercifolia* in E. U. S. All of them are ornamental in autumn foliage, but not hort. subjects.

Cultivation is simple in any garden soil. Propagated by seeds and root-cuttings; some species by layers and by cuttings of mature wood. Planted mostly in shrubbery borders for the luxurious effect of the pinnate foliage, the bright red autumn color, and the dense fruit-heads.

americana: *Cotinus americanus.*

aromatica: *R. canadensis.*

canadensis (*R. aromatica. Schmaltzia crenata*). Fragrant S. Shrub to 8 ft.: lvs. aromatic, of 3 ovate coarsely toothed lfts. to 3 in. long: fls. yellowish, in clustered spikes before the lvs.: fr. red and hairy. Ont. to Minn., south to Fla. and La.

cismontana. Shrub to 6 ft.: lvs. of 11–15 lanceolate sharply toothed lfts. to 4 in. long: fls. greenish-yellow: fr. red and hairy. S. D. to Wyo., south to Ariz. and N. Mex. Var. **flavescens** has yellow fr. changing to russet and light green foliage.

cognata: *R. trilobata.*

copallina. Shining S. Shrub or tree to 20 ft.: lvs. of 9–21 oblong-lanceolate usually entire lfts. to 4 in. long, the stalk winged: fls. greenish, in dense terminal panicles in July and Aug.: fr. red and hairy. Me. to Minn., south to Fla. and Tex.

coriaria. Shrub to 20 ft.: lvs. of 9–15 oval to oblong toothed lfts. to 2 in. long, pubescent beneath, the petiole winged: fls. greenish, in loose terminal panicles in July: fr. red, hairy. Medit. region.

cotinoides: *Cotinus americanus.*

Cotinus: *Cotinus coggygria.*

glabra. Smooth S. Glabrous shrub or tree to 20 ft.: lvs. of 11–31 oblong-lanceolate toothed lfts. to 5 in. long: fls. green, in dense panicles in June and July: fr. scarlet and hairy. N. S. to Minn., south to Fla. and La. Var. **laciniata** has deeply cut lfts.

hirta: *R. typhina.*

integrifolia. Sour Berry. Evergreen shrub or tree to 30 ft.: lvs. simple, oval, to 2 in. long, entire or toothed: fls. white or pinkish, in pubescent panicles: fr. dark red and hairy. S. Calif.

javanica (*R. Osbeckii. R. semialata*). Shrub or tree to 25 ft.: lvs. of 7–13 ovate commonly toothed lfts. to 5 in. long, brownish-pubescent beneath, the stalk winged: fls. creamy-white, in large terminal panicles in Aug. and Sept.: fr. red and hairy. China, Japan, S. Asia.

lancea. Small tree: lvs. compound, the lfts. lanceolate-linear, to 5 in. long: fls. in axillary panicles shorter than the lvs. S. Afr.

laurina. Laurel S. Evergreen glabrous shrub: lvs. simple, ovate to lanceolate, to 3 in. long, entire: fls. greenish-white, in dense panicles: fr. whitish, glabrous. S. and Lower Calif.

Osbeckii: *R. javanica.*

ovata. Sugar-Bush. Evergreen shrub to 10 ft.: lvs. simple, ovate, to 3 in. long, usually entire: fls. light yellow, in short dense spikes: fr. dark red and hairy. S. Calif., Ariz.

semialata: *R. javanica.*

succedanea. Wax-Tree. Shrub or tree to 30 ft.: lvs. of 9–15 oblong lfts. to 4 in. long, shining above: fls. yellow-green, in panicles in May: fr. whitish. Asia.

sylvestris. Tree to 30 ft.: lvs. of 7–13 ovate lfts. to 4 in. long: fls. brownish-pubescent, in panicles in June: fr. brownish-yellow, glabrous. China, Japan, Korea.

terebinthifolia. Evergreen shrub to 6 ft.: lvs. of 3–15 oblong to ovate lfts. to 2½ in. long: fr. red or orange, hairy. Mex., Guatemala.

trilobata (*R. cognata. Schmaltzia trilobata*). Lemonade S. Ill-smelling shrub to 6 ft.: lvs. of 3 ovate usually coarsely toothed lfts. to 1 in. long: fls. greenish, in clustered spikes before the lvs.: fr. red and hairy. Ill. to Calif.

typhina (*R. hirta*). Staghorn S. Shrub or tree to 30 ft. with densely pubescent twigs: lvs. of 11–31 oblong-lanceolate toothed lfts. to 5 in. long: fls. greenish, in dense terminal panicles, in June–July: fr. crimson and hairy. Que. to Ga. and Ia. Var. **dissecta** has lfts. cut and var. **laciniata** lfts. and bracts laciniately toothed.

verniciflua. Varnish-Tree. Lacquer-Tree. Tree to 60 ft.: lvs. of 11–15 ovate-oblong entire lfts. to 8 in. long: fls. whitish, in loose axillary panicles, in June and July: fr. yellowish, glabrous. Japan, China.

RHYNCHOSIA (*Dolicholus*). *Leguminosæ.* Per. herbs or subshrubs with pinnately trifoliate lvs., usually yellow papilionaceous fls. in axillary racemes, and flattened pods; rarely grown for ornament in warm regions.

minima. Slender twiner or trailer: lfts. rhombic-ovate: fls. ¼ in. long: pods to ¾ in. long. Tropics.

puberula (*Desmodium ciliatum*). Prostrate or partially climbing, with many flexuose branches: lfts. oblong: fls. ⅓ in. long: pods to ¾ in. long. Cape.

RHYNCHOSPERMUM: *Trachelospermum.*

RHYNCHOSTYLIS. *Orchidaceæ.* Epiphytic orchids with leafy sts. and fls. in dense racemes, the dorsal sepal and petals similar, lateral sepals broader, the lip entire and spurred. For cult. see *Orchids.*

retusa (*Saccolabium Blumei*). Lvs. to 1 ft. long and 1 in. wide: fls. ¾ in. across, in many-fld. pendulous racemes to 1½ ft. long; sepals and petals white spotted with red; lip red-purple, June–July. India, Java, Philippines.

violacea: *Anota violacea.*

RHYTICOCOS. *Palmaceæ.* One large monœcious unarmed ringed feather-palm of Jamaica and Caribbean Isls., a segregate from Cocos with the aspect of Arecastrum. **R. amara** (*Cocos amara. Syagrus amara*). Tree to 50 or 60 ft. with relatively thick trunk: lvs. long and heavy, dark shining green; pinnæ numerous, aggregate or fascicled particularly toward base of lf., middle ones 1½–2 in. broad, conduplicate, with very strong midrib: spathe conspicuously plicate-sulcate on outside; pistillate fls. ovate or ovate-conic when closed, petals valvate at apex: fr. very large, 2–2¾ in. long, heavily fibrous-coated, ovoid with blunt apex; nutlet 1-celled, the wall bony and very thick; albumen ruminate, with cavity in center when dry.—A handsome tree, standing in S. Calif.

RIB: in a leaf or similar organ, the primary vein; also any prominent vein or nerve.

RIBBON-BUSH: *Homalocladium.*

RIBES. Currants. Gooseberries. *Saxifragaceæ.* Shrubs of temp. regions, mostly deciduous, sometimes prickly, with alternate usually palmately lobed lvs., bisexual or unisexual fls. in racemes or solitary, appearing in spring with the lvs., and fr. a berry. Some species are grown for the edible frs. (as *R. Grossularia, R. hirtellum, R. odoratum, R. nigrum, R. sativum*) and others for ornamental habit and bloom. For cult. see *Currant and Gooseberry.* Propagated by cuttings and mound-layers as well as by means of seeds.—Ribes proper, including the currants, is without spines at the nodes and the fls. are mostly in racemes on jointed pedicels. The Grossularia section (by some authors held as a separate genus), comprising the gooseberries, is prevailingly prickly and the fls. are solitary or few and pedicels commonly not jointed; the synonymy indicates them.

alpestre. Hedge G. To 10 ft., armed with spines about 1 in. long: fls. greenish or reddish, 1–2 together: fr. purple, glandular-bristly. Himalayas, China.

alpinum. Mountain C. To 8 ft., unarmed: fls. diœcious, greenish-yellow, in erect racemes: fr. scarlet, glabrous. Eu. Hort. vars. are **aureum** with yellowish foliage, **laciniatum** with deeply cut lvs., **pumilum** dwarf.

americanum (*R. floridum*). American Black C. To 5 ft., unarmed: lvs. resinous-dotted beneath: fls. yellowish-white, in many-fld. drooping racemes: fr. black, glabrous. N. S. to Va. and Colo.

aureum (*R. tenuiflorum. Chrysobotrya aurea*). Golden C. To 6 ft., unarmed: fls. yellow, in 5–15-fld. racemes: fr. black or purplish, glabrous. Wash. to Mont. and Calif. Var. **chrysococcum** has orange-yellow fls. Var. **gracillimum** differs chiefly in calyx characters.—See *R. odoratum.*

californicum. To 4 ft., spiny: fls. white with greenish or purplish calyx, solitary: fr. bristly. Calif.

cereum. To 3 ft., unarmed, glandular-pubescent: fls. white or greenish, in few-fld. drooping racemes: fr. bright red. B. C. to Mont. and Calif.

curvatum (*Grossularia curvata*). To 3 ft., with spines to ¼ in. long: fls. white, 1–5 together: fr. greenish, glabrous. Ga. to La. and Tex.

Cynosbati (*Grossularia Cynosbati*). To 5 ft., with spines to ½ in. long or lacking: fls. green, 1–3 together: fr. wine-red, prickly. N. B. to N. C. and Ala. Var. **inerme** is a native form without prickles.

Diacantha. To 6 ft., armed with small prickles: fls. diœcious, greenish-yellow, in erect racemes: fr. scarlet, glabrous. N. Asia.

echinellum (*Grosullaria echinella*). To 3 ft., with spines about ½ in. long: lvs. less than 1 in. long: fls. green or greenish-white, 1–2 together: fr. green, very prickly. Fla.

fasciculatum. To 5 ft., unarmed: fls. diœcious, yellowish, fragrant, the staminate in 4–9-fld. umbels, the pistillate in 2's: fr. scarlet, glabrous. Japan, Korea. Var. **chinense** is larger. N. China.

floridum: *R. americanum.*

glandulosum (*R. prostratum*). Fetid C. Low, with prostrate sts.: fls. white or pinkish, in 8–12-fld. racemes: fr. red, bristly. N. Amer.

glutinosum. To 12 ft., unarmed, glandular-pubescent: fls. red, in spreading or nodding racemes: fr. black, bloomy. Calif.

Gordonianum. Hybrid between *R. sanguineum* and *R. odoratum* with yellow fls. tinged red outside.

gracillimum: *R. aureum* var.

Grossularia (*Grossularia reclinata*). English G. To 3 ft., with spines to ½ in. long: fls. greenish, 1–2 together: fr. red, yellow, or green, pubescent. Eu., N. Afr., S. W. Asia.—Original of the large European gooseberries. Var. **Uva-crispa** has smaller lvs. and yellowish fr.

hesperium (*Grossularia hesperia*). To 10 ft., with spines to ½ in. long: fls. greenish-red, 1–2 together: fr. very prickly. S. Calif.

hirtellum (*Grossularia hirtella*). To 3 ft., the branches bristly: fls. greenish or purplish, 1–3 together: fr. purple or black, commonly glabrous. Newf. to W. Va. and S. D.—Original either directly or through hybridization of the American pomological gooseberries.

inerme. To 6 ft., usually with few small spines: fls. green or purplish, 1–4 together: fr. purplish-red, smooth. B. C. to N. Mex.

japonicum. To 6 ft., unarmed: fls. greenish or brownish, in erect racemes: fr. black, smooth. Japan.

lacustre (*Limnobotrys lacustris*). To 3 ft., with clustered spines and bristles: fls. greenish or purplish, in 12–20-fld. drooping racemes: fr. purple, bristly. N. Amer.

leptanthum (*Grossularia leptantha*). To 6 ft., with spines to ½ in. long: fls. greenish-white, 1–2 together: fr. black, shining. Colo. to New Mex.

Lobbii (*Grossularia Lobbii*). To 6 ft., with spines to ¾ in. long: fls. purple-red, 1–2 together: fr. purple, densely glandular. B. C. to Calif.

malvaceum. To 6 ft., unarmed: fls. pink or purple, in drooping racemes: fr. sticky-pubescent. Calif.

missouriense (*Grossularia missouriensis*). To 6 ft., more or less bristly and the spines ¾ in. or less long: fls. greenish-white, 2–3 on slender peduncle: fr. purplish, glabrous. Tenn. west and northwest.—Like *R. niveum* but with smaller and greener fls.

nevadense. Unarmed: fls. rose, in 12–20-fld. racemes: fr. blue, glaucous. Ore., Calif., Nev.

nigrum. European Black C. To 6 ft., unarmed: fls. greenish-white, in 4–10-fld. drooping racemes: fr. black, glabrous. Eu., Asia. Some of the hort. vars. are: **chlorocarpum**, fr. green; **heterophyllum** (var. *laciniatum*), lvs. deeply cut; **reticulatum**, lvs. mottled with yellow; **xanthocarpum**, fr. yellow or whitish.—The black currants of fruit-gardens are of this species.

niveum. To 10 ft., with spines to ¾ in. long: fls. white, 1–4 together: fr. bluish-black, glabrous. Ida., Wash., Nev.

odoratum (*Chrysobotrya odorata*). Buffalo C. To 6 ft., unarmed: fls. yellow, fragrant, in 5–10-fld. racemes: fr. black, glabrous. S. D. to Tex. Grown for fr. in the form known as Crandall.—Closely related to *R. aureum* and differing chiefly in having the sepals less than half the length of the calyx-tube; these species have been confused.

orientale (*R. resinosum*). To 6 ft., unarmed: fls. diœcious, green tinged with red, in short racemes: fr. scarlet, pubescent. Eu., Asia.

oxyacanthoides (*Grossularia oxyacanthoides*). Low, bristly, with spines ½ in. or less long: fls. greenish-white, 1–2 together: fr. red, smooth. N. Amer.

petræum. To 6 ft., unarmed: fls. red or pink, in racemes to 4 in. long: fr. dark red. Mts. of Eu.

pinetorum (*Grossularia pinetorum*). To 6 ft., with spines 1 in. or less long: fls. orange-red, 1–2 together: fr. purple, prickly. Ariz., New Mex.

prostratum: *R. glandulosum.*

resinosum: *R. orientale.*

robustum. Hybrid between *R. niveum* and probably *R. inerme:* spines small: fls. white or pinkish.

rotundifolium. To 3 ft., with few small spines: fls. greenish-purple, 1–3 together: fr. purplish, smooth. Mass. to N. C.

rubrum. Northern Red C. To 6 ft., unarmed: fls. greenish-brown, in racemes: fr. red. Eu., Asia.—Cult. in Eu. but seldom in Amer.

sanguineum. To 12 ft., unarmed: fls. red, in many-fld. racemes: fr. bluish-black, bloomy. B. C. to N. Calif. Vars. **atrorubens** and **splendens** have dark red fls.

sativum (*R. vulgare*). Common or Garden C. To 5 ft., unarmed: fls. green or purplish, in many-fld. drooping racemes: fr. red or white, juicy. W. Eu. Var. **macrocarpum**, Cherry C., has large red frs. Var. **variegatum** has lvs. variegated with white or yellowish.—Here belong the common pomological currants.

setosum (*Grossularia setosa*). To 3 ft., bristly, with spines to about 1 in. long: fls. white, 1–3 together: fr. red or black, glabrous or slightly bristly. Ida. to S. D.

speciosum (*Grossularia speciosa*). Fuchsia-flowered G. Evergreen, to 12 ft., bristly and spiny: fls. bright red, 2–4 together, drooping, the stamens long exserted: fr. red, glandular-bristly. Calif.

stenocarpum (*Grossularia stenocarpa*). To 6 ft., spiny: fls. reddish, 1–3 together: fr. greenish or reddish, mostly glabrous. China.

tenue. To 8 ft., unarmed: fls. diœcious, brownish-red, in racemes: fr. red. W. Asia.

tenuiflorum: *R. aureum.*

triste. Swamp Red C. Sts. decumbent: fls. purple, in drooping racemes: fr. red, smooth. N. N. Amer., N. Asia.

viburnifolium. Evergreen, to 8 ft., unarmed: fls. rose, in erect racemes: fr. red. S. Calif., Lower Calif.

vulgare: *R. sativum.*

RICCIA. A genus of hepatics or liverworts (which are allied to mosses), one of which may be seen in aquaria or pools; it is *R. fluitans*, with little green radiating thalluses on the surface of the water much like branching lemnas and which may be gathered with those plants on stagnant and roadside pools: thallus or plant-body forking and becoming an inch or two long, sometimes forming mats, without root-hairs when floating but developing them when stranded on mud, the branches or divisions ⅛ in. or less broad.

RICE: *Oryza sativa.* **-Flower**: *Pimelea.* **Wild**: *Zizania.*

RICHARDIA. *Rubiaceæ.* Pubescent or hairy herbs with opposite entire lvs. and white or pink fls. in terminal clusters subtended by an involucre, having funnelform corolla and 3–5-lobed limb. See *Zantedeschia* for calla-lily once known as Richardia.

One species is grown as a forage, green-manure and cover-crop in southern United States. It thrives on sandy soil. Propagated by seeds.

scabra (*Richardsonia scabra*). Mexican Clover. Ann. with erect or diffuse sts. to 4 ft. long: lvs. ovate to lanceolate, to 3 in. long, rough: fls. white, ¼ in. long. S. C. to S. Amer.

RICHARDSONIA: *Richardia scabra.*

RICINUS. *Euphorbiaceæ.* One variable species widely nat. in the tropics and warm regions but probably originally from Afr., commonly planted for foliage effects; the seeds yield oil which is extensively used for medicinal and other purposes.

Castor-beans thrive in sandy or clay loams with good drainage, although they grow on any land not too wet. Seeds may be sown where the plants are to stand or placed in pots under glass and transplanted about the middle of May.

communis. Castor-Bean. Castor-Oil-Plant. Palma Christi. Ann. to 15 ft., or in tropics a tree to 40 ft.: lvs. peltate, palmately divided into 5–11 lobes, to 3 ft. across: fls. monœcious, without petals, in panicles 2 ft. or more long: fr. to 1 in. long, covered with soft dark brown spines. Runs into numerous forms, the best known of which are: **africanus** with very large green lvs.; **borboniensis arboreus** with red sts. and glaucous lvs.; **cambodgensis** with very dark foliage and sts.; **Gibsonii**, a small form with dark red foliage having a metallic luster; **hybridus panormitans**, a large form with dark very glaucous foliage; **macrocarpus**, purple-red foliage; **macrophyllus**, purple-red; **purpureus**, purple-red; **sanguineus** with red lvs.; **zanzibarensis**, bright green lvs. with white veins.

RICOTIA. *Cruciferæ.* A few annuals of the Medit. region: glabrous and much branching: lvs. mostly pinnatisect: fr. a broad flat pod. **R. Lunaria**, of Egypt and Syria, is a diffuse quick-growing ann. sometimes raised for its lilac radish-like fls. and large flat thin odd pods.—Sow in the open in spring; fls. should appear in two months or less; plant 8–20 in. high, spreading; sometimes used in rockwork.

RIMU: *Dacrydium cupressinum.*

RIVINA. *Phytolaccaceæ.* Slender herbs with alternate entire lvs., small bisexual fls. in many-fld. racemes, and fr. a red berry; grown out-of-doors and in the greenhouse for the ornamental little berry-like frs. Propagated by seeds or cuttings in spring over heat.

aurantiaca: *R. humilis.*

humilis (*R. aurantiaca*). Rouge-Plant. To 3 ft.: lvs. ovate, to 4 in. long: fls. white or rosy. S. U. S. and trop. Amer.

ROBERTIELLA: *Geranium Robertianum.*

ROBINIA. Locust. *Leguminosæ.* American trees and shrubs with pinnate lvs., showy papilionaceous fls. in usually pendulous racemes, and flattened pods; planted for ornament.

Locusts are mostly hardy in the North and thrive in any usual soil. Propagated by seeds sown in spring, by suckers, root-cuttings and division, and special varieties by grafting.

Boyntonii (*R. hispida* var. *rosea*). Shrub to 10 ft.: lfts. 7–13, elliptic or oblong: fls. pink or rose-purple and white, May–June: pods glandular-hairy. N. C. to Ga. and Ala.

Decaisneana: *R. PseudoAcacia* var.

hispida. Rose Acacia. Shrub to 9 ft., with bristly hairs: lfts. 7–13, oval: fls. rose or pale purple, May–June: pods bristly-hairy, to 2½ in. long. S. E. U. S. Var. **Camusetti** has deep red bristles. Var. **macrophylla** has larger lfts. and fls. and the branchlets and petioles are nearly destitute of bristles.

Holdtii. Hybrid between *R. luxurians* and *R. PseudoAcacia*: fls. light pink or rose.

Kelseyi. Shrub to 10 ft.: lfts. 9–11, oblong-lanceolate: fls. rose, May–June: pods bristly-hairy, 2 in. long. N. C.

luxurians. Shrub or tree to 30 ft.: lfts. 15–21, oblong: fls. pale rose or nearly white, June–Aug.: pods glandular-hairy, to 4 in. long. Colo. to Utah and New Mex.

neo-mexicana. Shrub to 6 ft.: lfts. 9–15, elliptic-lanceolate: fls. rose, June–Aug.: pods smooth, to 4 in. long. New Mex.

PseudoAcacia. False Acacia. Black Acacia. Yellow L. Tree to 80 ft., nearly glabrous, the branches prickly: lfts. 7–9, oval: fls. white, fragrant, May–June: pods reddish-brown, glabrous, to 4 in. long, remaining on tree over winter. E. and Cent. U. S. Var. **amorphifolia** has narrow oblong lfts., var. **Bessoniana** slender unarmed branches, var. **Decaisneana** light rose-colored fls., and var. **inermis** (*R. spectabilis*) unarmed branches. Var. **semperflorens** flowers throughout the year. Var. **tortuosa** has short twisted branches. Var. **umbraculifera** has a dense head and unarmed branches. Var. **unifoliola** (*monophylla*), lfts. reduced to 1 to 3 or more.

spectabilis: *R. PseudoAcacia* var. *inermis.*

viscosa. Clammy L. Tree to 40 ft., young branches and other parts glandular-viscid: lfts. 13–25, ovate: fls. pink, May–June: pods with glandular hairs, to 3½ in. long. S. U. S.

ROBLE: *Platymiscium polystachyum.*

ROCAMBOLE: *Allium Scorodoprasum.*

ROCHEA. *Crassulaceæ.* Succulent S. African subshrubs with opposite simple lvs. and white, yellow or red fls. in dense terminal clusters, the petals joined to about the middle; one sometimes grown in greenhouses for the bloom. For cult. see *Succulents.*

coccinea (*Crassula* and *Kalosanthes coccinea*). To 2 ft.: lvs. ovate, to 1½ in. long, closely imbricated: fls. bright scarlet, fragrant, to 2 in. long, with long slender tube. S. Afr.

ROCK-BRAKE: *Cryptogramma*. -Rose: *Cistus*.

ROCKET: *Diplotaxis, Hesperis*. -Salad: *Eruca sativa*.

ROCKFOIL: *Saxifraga*.

ROCK-GARDENING. A type of gardening in which special provision is made for rock-loving or saxicolous plants. It is likely to be confused with alpine-gardening, which may be only one phase of it: see *Alpines*. A rock-garden is not primarily a pile of rocks: the rocks and stones are employed for the purpose of providing proper conditions for the growing of plants. The plants, rather than the rocks, are the primary consideration; and the plants should be such as specially thrive in rock crevices and pockets or at least be comparable with them in size and form. A tumulus of rocks in which is grown a miscellaneous collection of plants that do not profit by such conditions is not a rock-garden: such plants may be grown with less trouble elsewhere, and are likely to be much more in keeping.

Much of the charm of a rock-garden depends on its setting. In a city or town lot a rock-garden may be established in the rear without particular relation to a landscape although it should have connection with boundaries, but in properties of any size such a garden should conform to contours and to the subdivision of the area. Not every park or pleasure-ground has an acceptable setting for a rock-garden. It is to be remembered, also, that not every so-called rock-garden is an object of interest and beauty. Unless under the hand of a specially skilled gardener who maintains a continued interest in it, such an area is likely soon to fall into neglect and disrespect, and it becomes an abundant lodgement for weeds and vagrants.

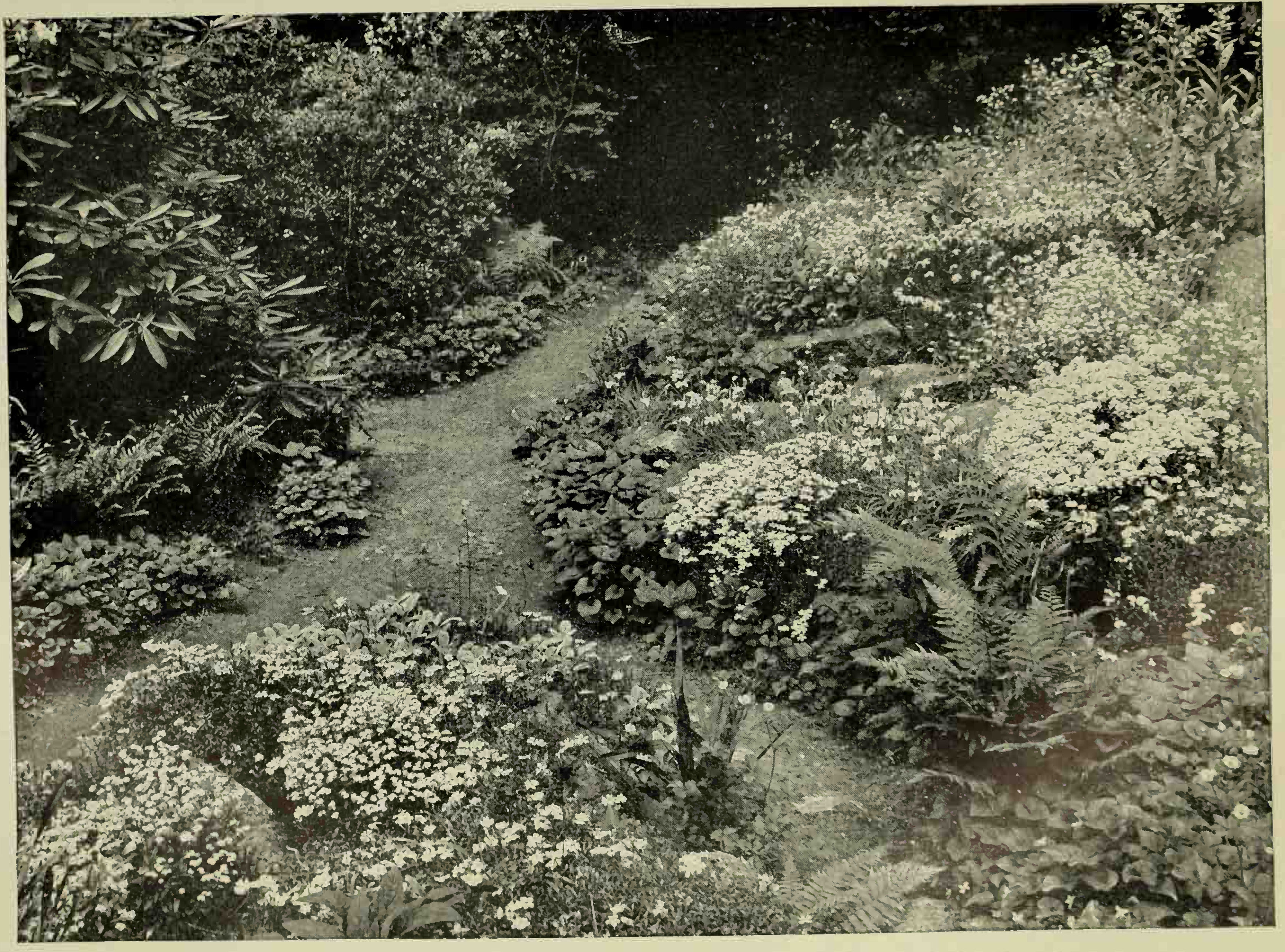
The special appeal of a rock-garden lies in the skilful growing of plants that in nature inhabit cliffs, moraines and mountains. Many such plants are tall and take much room in the wild, but those kinds most prized in the constructed rock-garden are the low, tufted and spreading species, for the most part perennial. They are likely to have a penetrating root system, often a pronounced tap-root, and are therefore able to establish themselves in deep cool moist chinks and depressions. The proper preparation for the rock-gardener is a keen knowledge of such plants: he then finds or makes conditions for them where they may come to perfection. Having provided a proper place for the plant, he will keep it in place, restricting it to its confines. He will be careful with his labels and his note-book records. He will provide inhabitants for all the pockets or spaces, and this may require a supply of extra plants, sometimes even of temporary annuals if they are conformable and not the usual horticultural subjects of flower-gardens and borders.

The exposure of the rock-garden must depend on the kinds of plants to be grown in it, and the climate. In general, it should occupy an open free space not over-shadowed with trees or buildings; yet in parts of North America it is well if the severity of midday and afternoon sun can be mitigated. The area should be protected from the roots of trees that may forage underneath it.

Knowing the kinds of plants he may wish to grow, the rock-gardener will make his rock areas to suit them. The construction will be neat and trim, and have good lines and proportions. If there are rocky cliffs or outcrops on the property, he may utilize them rather than attempt to make a wholly artificial area. Stone walls and old foundations may sometimes be utilized to advantage. Old quarries often yield excellent results. The rock-garden will not be a mere display of rocks. The larger part of any structural rock or stone is below the surface of the ground. In placing the rocks one must always have in mind the providing of good roothold for plants. All cavities should be firmly filled to avoid covered hollows that dry out. Every part of the construction should be easily accessible from paths and trails. The success or failure of the rock-garden may depend on the ability to hold moisture and thereby to carry the plants through dry times, although provision must be at hand for applying water when needed. On the other hand, good natural drainage is essential, for saxicoles are not bog-plants. The soil with which to fill the pockets and leads will be conditioned on the plants to be grown, but in general its main elements should be good garden earth, fine or sifted leaf-mold or peat, and gritty sand or fine gravel, all well mixed. Fertilizing is likely to be necessary.

The visible part of the rock construction should be attractive. Rocks from the neighborhood or region are commonly the most desirable. There should be harmony in the work, the rocks, and the positions and directions in which they are laid, presenting a pleasing uniformness of character. Likewise it is necessary that the plants produce a harmonious picture. Much of this harmony will reside in vegetation, presented in tufts, mats, and growths lying close to stones. Many of the rock-garden mats are evergreen; and at appropriate places very dwarf compact forms of certain conifers may be utilized, as well as various kinds of shrublets.

The kinds of plants suited to rock-gardening are legion. Crassulaceous plants of this character are many (see *Succulents*); also ferns; some of the best of them in other families are in the genera æthionema, allium, alyssum, androsace, anemone, aquilegia, arabis, arenaria, aster (dwarf), aubrieta, campanula, cassiope, corydalis, cotoneaster, daboecia, daphne, dianthus, draba, dryas,



XIV. Rock-garden. — A profusion of interesting bloom, foliage and plant forms

epigæa, epimedium, erinus, gentiana, heuchera, iberis, iris (dwarf), leontopodium, lewisia, linaria, linnæa, lithospermum, loiseleuria, lychnis, oxalis, papaver, petrocallis, phyllodoce, phlox, potentilla, primula, ranunculus, rhododendron, saxifraga, shortia, soldanella, thymus, viola, wahlenbergia. The attentive rock-gardener will observe the saxicolous plants native in his region and find satisfaction in growing them.

A rock-garden properly placed, constructed and maintained, and with a population of well chosen and skillfully grown plants, constitutes one of the choicest departments of horticulture.

RODGERSIA. *Saxifragaceæ.* Hardy herbaceous perennials with thick rootstocks, showy terminal fl.-clusters: lvs. large, peltate or digitately or pinnately compound: native in China and Japan, variously hardy N. Multiplied by division of the plants, also by seeds when obtainable.

podophylla. To 5 ft., with thick scaly rootstock: lvs. finger-shaped, the 5 lobes angled and toothed, to 10 in. long and 6 in. wide, light green in spring, in summer metallic bronzy: fls. small, yellowish-white, in panicles to 1 ft. long, making a fluffy spray. China.

sambucifolia. To 3 ft.: lvs. pinnately compound into 3–11 lfts.: fls. white, small, in terminal flat-topped panicles. China.

tabularis. To 3 ft.: lvs. peltate, to 3 in. across, long-petioled, with many short lobes resembling teeth: fls. white, small, in many-fld. panicles. China.

RODRIGUEZIA. *Orchidaceæ.* S. American epiphytes having small 1–2-lvd. pseudobulbs and fls. in racemes, the petals and dorsal sepal similar, the lateral sepals united and concave, the lip slightly 2-lipped and with a short spur; grown in intermediate temperatures. See *Orchids.*

venusta (*Burlingtonia fragrans*). Lvs. linear-oblong, to 9 in. long: fls. white, fragrant, about 1½ in. across, in pendulous racemes, the lip with a yellow spot, Oct. Brazil.

ROEMERIA. *Papaveraceæ.* Ann. slender herbs of the Medit. region, with yellow juice, pinnately dissected lvs., and violet or blue solitary fls.; sometimes planted for the bloom.

refracta. To 1 ft.: lvs. with linear segms.: fls. blue, spotted with black at base, to 1 in. long. Asia Minor, Caucasus.

ROGIERA: *Rondeletia.*

ROHDEA. *Liliaceæ.* One Chinese and Japanese herb sometimes grown as a durable foliage plant in the house or out-of-doors in mild climates; much prized in the Far E. **R. japonica.** Lvs. basal, to 2 ft. long and 3 in. broad, leathery: fls. tightly packed in a thick short spike terminating the scape, resembling an aroid, concealed by the foliage: fr. a large berry with red pulp. There are many forms with striped, variegated, and otherwise modified lvs.

ROLLINIA. *Annonaceæ.* Trop. American trees and shrubs with alternate simple lvs., bisexual fls. with the 3 outer petals produced into wings or spurs, and fr. a fleshy syncarp resembling Annona. Cult. as for *Cherimoya.*

mucosa (*R. Sieberi*). Small tree: lvs. elliptic, to 8 in. long, pubescent beneath: fls. rusty-tomentose, about 1 in. long: fr. nearly globose, 3 in. across, covered with tubercles, edible. W. Indies, Mex.

Sieberi: *R. mucosa.*

ROMANZOFFIA. *Hydrophyllaceæ.* A few per. herbs of W. N. Amer., in habit resembling a delicate saxifrage: lvs. mostly basal, round-cordate and lobed, long-stalked: fls. pale pink, purple or white, in racemes on scape-like sts.

sitchensis. To 9 in., the rootstock bearing tubers: fls. white, on long stalks. Alaska to Calif.

ROMNEYA. *Papaveraceæ.* One per. herb (or perhaps to be regarded as 2 species), native in S. Calif. and Mex., striking as a flower-garden and border subject where hardy. Propagated by suckers and seeds but the latter require several years before blooming. It transplants with difficulty. **R. Coulteri.** MATILIJA-POPPY. To 8 ft.: lvs. pinnately cut, to 4 in. long: fls. white, fragrant, 6 in. across, solitary. Var. **trichocalyx** has a beakless bristly calyx.

RONDELETIA (*Rogiera*). *Rubiaceæ.* Trop. American evergreen shrubs and trees with mostly opposite lvs., tubular 4–5-lobed fls. in cymes in red, yellow or white, and capsular frs.

Rondeletias are grown out-of-doors in the South, and in the greenhouse North where the temperature should not be allowed to go below 50°. Propagated by cuttings of half ripened wood.

amœna (*R. versicolor*). Shrub or small tree: lvs. ovate, to 6 in. long, densely pubescent beneath: fls. pink, pubescent, with yellow-bearded throat, ½ in. long. Mex. to Panama.

cordata. Shrub to 7 ft.: lvs. ovate-oblong or ovate, to 5 in. long, nearly glabrous: fls. pink or red, pubescent. with yellow-bearded throat, ¼ in. across. Guatemala.

odorata (*R. speciosa*). Shrub to 6 ft.: lvs. ovate to oblong, 2 in. long, nearly glabrous, margins often revolute: fls. orange-red with yellow throat, ½ in. across. Cuba, Panama.—The commonest species in cult.

speciosa: *R. odorata.*

splendens: listed name.

thyrsoidea. Shrub to 6 ft.: lvs. ovate or oval, to 6 in. long, pubescent beneath: fls. yellow, ¼ in. long, pubescent. Jamaica.

versicolor: *R. amœna.*

ROOF-GARDENING. A recent development in crowded cities to grow plants regularly on the roof, quite a different enterprise from the "roof-gardens" of hotels and similar places. The following article is from Lucy H. Joshua, N. D. Hort., in The Women's Farm and Garden Association (England):

It is not a cheap pleasure—carrying or hoisting up the materials is laborious and therefore expensive—plants are not so permanent as in the open ground, and the possibilities are to a certain extent restricted, but, provided the roof is not too wind-swept, the conditions should be healthier and more airy than in the average shut-in back garden.

Two conditions are necessary—the roof must be strong enough to support the weight of soil, and there must be adequate means for water to drain off. The first condition must be carefully inquired into, by application to the builder, but the maximum weight allowed is not likely to be more than ½ cwt. to a square foot, which allows for 1 foot depth of soil. Except on a reinforced building, it will probably be desirable to distribute the weight. A very good effect can be obtained by using oblong boxes, alternately with square or round tubs, to give the effect of different shaped beds, and the corners can be made very attractive by having boxes made to fit them. The wood used should be from ¾ to 1 inch thick—the slight extra cost is more than compensated by the durability and the boxes must be preserved by tarring or painting, or preferably both. An extra precaution against rotting is to have the boxes supported on cross bars or bricks, so that all superfluous moisture drains away. On a very strong roof, it is possible to make permanent beds with walling stone, set together with the minimum of cement; the initial cost will of course be greater, but no renewal will be necessary, as in the case of the boxes, which, of course have only a limited life. If these permanent beds are of any considerable length, it will be advisable to run a 2-inch pipe along the bottom, sloping slightly to a convenient outlet, and both beds and boxes need a good drainage layer of clinker and between that and the soil some thoroughly well rotted manure. Make an effort to get really good loam; it is worth while; and add some mortar rubble and sand to it, to ensure it keeping sweet. The roof is sure to be railed round, and against this railing one can fix wooden trellis, 4 to 6 feet high; inclosing the space gives at once the effect of a garden, besides allowing for climbing plants.

ROOTSTOCK: subterranean stem; rhizome.

ROQUETTE: *Eruca sativa.*

RORIPA ARMORACIA: *Armoracia rusticana.*

ROSA. Rose. *Rosaceæ.* A large genus of shrubs, mostly prickly, often more or less scandent, native mostly in the north temp. zone, and furnishing many ornamental subjects: lvs. alternate, commonly pinnate: fls. white, yellow or red, solitary or in corymbs, prevailingly in early summer: fr. a hip, achenes inclosed in a fleshy nearly closed hollow receptacle, usually red. The species of Rosa can be accurately determined only from full technical descriptions; at this place some of the main horticultural features may be indicated. For cult. see *Rose.*

acicularis. To 3 ft.: lfts. 3–7, to 2 in. long: fls. deep rose, fragrant, 2 in. across, solitary. N. Amer., N. Asia. Var. **Bourgeauiana** has obtuse doubly toothed lvs. Var. **Engelmannii** (*R. Engelmannii*) is more bristly and lvs. are glabrous beneath.

alba. Presumably a hybrid between *R. dumetorum* and *R. gallica:* to 6 ft.: lfts. mostly 5, to 2½ in. long: fls. white or pinkish, fragrant, to 3 in. across, often double, in corymbs.—A source of attar of roses. Hardy N., and frequent in yards.

Alberti. To 3 ft.: lfts. 5–9, to 1¼ in. long: fls. white, 1¼ in. across. Turkestan.

alpina: *R. pendulina.*

altaica: *R. spinosissima* var.

anemoneflora. Climbing, partially evergreen: lfts. 3–5, to 3 in. long: fls. white, 1½ in. across, double with the inner petals shorter, in corymbs. China.

anemonoides. Hybrid probably between *R. lævigata* and *R. odorata:* climbing: lfts. 3–5: fls. light pink, single.

arkansana. To 1½ ft.: lfts. 9–11, to 2½ in. long: fls. pink, 1½ in across, in corymbs. Wis. to Kans. and Colo.

Arnoldiana. Hybrid between *R. rugosa* and *R. borboniana*: lfts. 5–7: fls. purplish, 2 in. across, semi-double, in corymbs.

arvensis (*R. repens*). Branches trailing: lfts. mostly 7, to 1½ in. long: fls. white, to 2 in. across, in corymbs or solitary. Eu.; hardy N. Var. **Ayreshirea,** Ayreshire R., is more vigorous.—The double-fld. forms are probably hybrids.

Banksiæ. Banksia R. Climbing to 20 ft., evergreen, with few prickles: lfts. commonly 3–5, to 2½ in. long: fls. white or yellow, 1 in across, slightly fragrant, in many-fld. umbels. China; not hardy N. Var. **albo-plena,** fls. double, white. Var. **lutea,** fls. double, yellow. Var. **lutescens,** fls. single, yellow. Var. **normalis,** fls. single, white.

banksiopsis. Lfts. 7–9, 1 in. long: fls. red, 1 in. across, in corymbs. China.

Barbieriana. A series of hybrids between *R. Wichuraiana* and *R. cathayensis:* lfts. 5–7: fls. red, 2 in. across, single.

bella. To 10 ft.: lfts. 7–9, to 1 in. long: fls. rose, 2 in. across, in 1–3-fld. corymbs. China.

bengalensis: *R. chinensis* var. *semperflorens.*

blanda. To 6 ft., often without prickles: lfts. 5–7, to 2½ in. long: fls. pink, 2 in. across, solitary or in few-fld. corymbs. Newf. to Pa. and Mo.

borboniana (*R. borbonica*). Bourbon R. Hybrid between *R. chinensis* and *R. gallica:* lfts. mostly 7: fls. red or purple, to 3 in. across, double or partially so, solitary or in few-fld. corymbs in late summer. Hybrid Bourbons represent crosses between this hybrid and *R. gallica, R. centifolia,* and *R. damascena*; these crossed with *R. chinensis* produced the group of Hybrid Perpetuals or Remontants, which are mostly hardy N.

borbonica: *R. borboniana.*

bracteata. Macartney R. To 20 ft., half-climbing, evergreen: lfts. 5–9, to 2 in. long, shining above: fls. white, 3 in. across, solitary, subtended by large toothed bracts. China; nat. in S. U. S.

Bruantii. A group of hybrids between *R. rugosa* and *R. odorata* or *R. dilecta.*

Brunonii. Himalayan Musk R. Tall, with partially climbing branches: lfts. 5–7, to 2½ in. long: fls. white, fragrant, to 2 in. across, in many-fld. corymbs. Himalayas; not hardy N.

californica. To 10 ft.: lfts. 5–7, to 1¼ in. long: fls. pink, 1½ in. across, in corymbs. Ore. to Lower Calif. Var. **plena** has fls. double or partially so.

Camellia: *R. lævigata.*

canina. Dog R. To 10 ft.: lfts. 5–7, to 1½ in. long: fls. white or pinkish, to 2 in. across, solitary or in few-fld. corymbs. Eu.

carolina (*R. humilis*). Pasture R. To 3 ft. or more, suckering: lfts. commonly 5, to 1¼ in. long: fls. rose, 2 in. across, usually solitary. Me. to Fla. and Tex. Var. **grandiflora** has fls. 2½ in. across. See *R. palustris.*

cathayensis (*R. multiflora* var. *cathayensis*). Branches somewhat climbing: lfts. usually 5–7, stipules fringed: fls. few, pink or rose, 1½ in. across, fragrant, in corymbs. China. Var. **platyphylla,** Seven Sisters R., fls. deep pink.—Here belong the Crimson Rambler roses.

caudata. To 12 ft.: lfts. 7–9, to 2 in. long: fls. red, 2 in. across, in few-fld. corymbs. China.

centifolia. Cabbage R. To 6 ft.: lfts. mostly 5, to 2 in. or more long: fls. pink, fragrant, to 3 in. across, solitary, nodding, very double with the petals overlapping. Caucasus. Var. **cristata** has edges of sepals mossy. Var. **muscosa,** Moss R., has mossy calyx and pedicels.—Seen in old yards, and hardy N.

cherokeensis: *R. lævigata.*

chinensis. China R. Low, evergreen or partially so: lfts. 3–5, to 2½ in. long, shining above: fls. red to nearly white, 2 in. across, in few-fld. corymbs. China; hardy only far S. Var. **Manettii** (*R. Manettii*). Manetti

R. Fls. pink, single or semi-double; used as a stock on which to grow greenhouse roses; by some considered to have the same hybrid origin as *R. Noisettiana.* Var. **minima.** FAIRY R. To 1 ft.: fls. rose-red, 1½ in. across, single or double. Var. **semperflorens** (*R. bengalensis*). Fls. crimson, usually solitary. Var. **viridiflora.** GREEN R. Fls. green, the petals represented by green lvs.

cinnamomea. CINNAMON R. To 6 ft.: lfts. 5–7, to 1½ in. long: fls. red, fragrant, 2 in. across, solitary or in few-fld. corymbs. Eu., Asia; escaped in E. U. S. Var. **plena** has double fls.

coriifolia. To 5 ft.: lfts. 5–7: fls. rose, solitary or in corymbs. Eu., W. Asia. Var. **Froebelii** has small white fls.

corymbulosa. To 6 ft.: lfts. 3–5, to 1½ in. long: fls. red, white in center, 1 in. across, in many-fld. corymbs. China.

damascena. DAMASK R. To 8 ft.: lfts. usually 5, to 2½ in. long: fls. pale pink to red, fragrant, double, in corymbs. Origin unknown; intro. from Asia Minor. Var. **versicolor,** YORK and LANCASTER R., has partially double white fls. striped with pink.—A source of attar of roses. Hardy N., and persists in old yards.

Davidi. To 10 ft.: lfts. 7–9, to 2 in. long: fls. pink, to 2 in. across, in corymbs. China.

davurica. Resembles *R. cinnamomea* but with straight instead of curved prickles and smaller lfts. N. Asia.

dilecta. A group of hybrids between *R. odorata* and *R. borboniana*, comprising the Hybrid Teas: fls. white, red, yellow, fragrant.

dumetorum (*R. canina* var. *dumetorum*). Distinguished from *R. canina* by the lfts. being pubescent rather than glabrous. Eu., W. Asia; hardy N.

Ecæ. To 6 ft.: lfts. 7–15, to ¾ in. long: fls. pale yellow, 1 in. across, solitary. Asia.

Eglanteria (*R. rubiginosa*). EGLANTINE. SWEETBRIER. To 8 ft., much branched: lfts. 5–7, to 1¼ in. long, glandular and fragrant: fls. pink, 2 in. across, solitary or in few-fld. corymbs. Eu.; nat. in N. Amer., and common in pastures.

Engelmannii: *R. acicularis* var.

Fendleri: *R. Woodsii* var.

ferox. Dwarf: lfts. 5–7, about ½ in. long: fls. white, about 1 in. across, in few-fld. corymbs. S. Eu., Asia Minor.

ferruginea: *R. rubrifolia.*

filipes. To 15 ft., the branches partially climbing: lfts. 5–7, to 3 in. long: fls. white, fragrant, about 1 in. across, in many-fld. corymbs. China.

fœtida (*R. lutea*). AUSTRIAN BRIER. To 10 ft.: lfts. 5–9, to 1½ in. long: fls. deep yellow, with unpleasant odor, to 3 in. across, commonly solitary. Asia; hardy N. Var. **bicolor,** fls. coppery. Var. **persiana,** PERSIAN YELLOW, fls. double.

foliolosa. To 1½ ft.: lfts. 7–9, to 1¼ in. long, shining above: fls. rose or white, 1½ in. across, solitary or in few-fld. clusters. Ark. to Tex. Var. **alba** has white fls.

Fortuneana. Hybrid between *R. Banksiæ* and probably *R. lævigata:* climbing: lfts. 3–5: fls. white, double, solitary.

fujisanensis. To 10 ft., sts. flexuose: lfts. 3–9, to ¾ in. long: fls. white, 1 in. across, in corymbs. Japan.

gallica. FRENCH R. To 4 ft.: lfts. 3–5, thick, to 2½ in. long: fls. pink or crimson, to 3 in. across, solitary. Eu., W. Asia. Var. **pumila** is a dwarf form with single red fls. Var. **versicolor** has partially double fls. striped white and red.—This rose is common in old gardens and often escapes or persists.

Gentiliana. To 12 ft., the branches partially climbing: lfts. 5, to 2½ in. long: fls. white, fragrant, to 1½ in. across, in many-fld. corymbs. China.

glauca (*R. Reuteri*). To 6 ft.: lfts. 5–7, to 1½ in. long, bluish-green: fls. rose, about 1½ in. across, solitary or in corymbs. Eu., W. Asia.—Some of the material grown as *R. glauca* is *R. rubrifolia.*

gratissima. To 6 ft., much branched: lfts. 5–7, to 1¼ in. long: fls. pink, about 1 in. across, in corymbs. Calif.

gymnocarpa. To 10 ft.: lfts. 5–9, to 1½ in. long: fls. rose, about 1 in. across, usually solitary. B. C. to Mont. and Calif.

Harisonii. HARISONS YELLOW R. Hybrid between *R. fœtida* and *R. spinosissima:* fls. pale yellow, double.

Helenæ. To 15 ft., with partially climbing branches: lfts. 7–9, to 2 in. long: fls. white, fragrant, about 1 in. across, in many-fld. corymbs. China; hardy N.

heliophila: *R. suffulta.*

hibernica. Hybrid between *R. spinosissima* and *R. canina:* fls. pink, 1 in. across.

Hugonis. HUGO R. To 8 ft., the branches drooping: lfts. 5–13, to ¾ in. long: fls. yellow, 2 in. across, solitary, May–June. China; hardy N., early.

humilis: *R. carolina.*

illinoensis: *R. spinosissima.*

indica: confused name, belonging mostly to *R. chinensis* and *R. odorata.*

Iwara. Hybrid between *R. multiflora* and *R. rugosa:* fls. white, single, small.

Jackii: *R. Maximowicziana* var.

Jacksonii. Hybrid between *R. Wichuraiana* and *R. rugosa:* fls. bright crimson.

Kukolinski. A cross or sport of *R. canina* which has been recommended as an understock.

lævigata (*R. Camellia. R. cherokeensis*). CHEROKEE R. Climbing to 15 ft., evergreen: lfts. usually 3, to 2½ in. long, shining: fls. white, fragrant, to 3½ in. across, solitary. China; nat. in S. U. S.

Lheritierana. BOURSAULT R. Hybrid between *R. pendulina* and *R. chinensis:* climbing to 20 ft.: lfts. 3–7: fls. red, in corymbs.

lucida: *R. virginiana.*

lutea: *R. fœtida.*

Lyonii. To 5 ft.: lfts. 5–7, to 2 in. long: fls. rose, to 2½ in. across, solitary or in few-fld. racemes. Mass. to Ga. and Kans. Var. **alba** has white fls.

MacDougalii: *R. nutkana* var. ***hispida.***

Macounii. To 6 ft., much branched: lfts. 5–7, to 1¼ in. long, glaucous beneath: fls. rose, 1½ in. across, solitary or in few-fld. corymbs. B. C. to Tex.

macrantha. Hybrid between *R. canina* and *R. gallica:* lfts. 5–7: fls. light pink, 3 in. across.

macrophylla. Large: lfts. 9–11, to 2½ in. long: fls. red, 2 in. or more across, solitary or in few-fld. corymbs. Himalayas.

Manettii: *R. chinensis* var.

Marretii. Branchlets dark purple: lfts. mostly 7, to 1½ in. long: fls. pink, solitary or in few-fld. corymbs. Saghalin Isl.

Maximowicziana. Branches partially climbing: lfts. 7–9, to 2½ in. long: fls. white, 1½ in. across, in many-fld. corymbs. N. Asia. Var. **Jackii** (*R. Jackii*) has no bristles.

melina. To 3 ft., much branched: lfts. usually 7, to 1¼ in. long: fls. rose, to 2 in. across, commonly solitary. Colo., Utah.

micrantha. To 6 ft., much branched: lfts. 5–7, to 1¼ in. long: fls. pink or white, about 1 in. across, solitary or in few-fld. corymbs. Eu.; escaped in N. Amer.

minutifolia. To 4 ft.: lfts. 5–7, ¼ in. or less long: fls. pink or white, 1 in. across. Lower Calif.

mirifica: *R. stellata* var.

mohavensis. To 3 ft.: lfts. usually 5, to ½ in. long: fls. rose, about 1 in. across, mostly solitary. Calif.

mollis. To 4 ft.: lfts. 5–7, to 1⅓ in. long, silky-tomentose beneath: fls. deep pink or rarely white, to 2 in. across, solitary or few. Eu., W. Asia.

moschata. MUSK R. Branches partially climbing or arching: lfts. 5–7, to 2 in. long: fls. white, with odor of musk, to 2 in. across, in 7-fld. corymbs. Medit. region; not hardy N. Var. **nastarana** (*R. Pissardii*) has more numerous pinkish fls. Var. **plena** has double fls.—Now little known in gardens.

Moyesii. To 10 ft.: lfts. 7–13, to 1½ in. long: fls. deep red, to 2½ in. across, solitary or in 2's. China.

multibracteata. To 6 ft.: lfts. 7–9, to ½ in. long: fls. pink, about 1 in. across, in corymbs. China.

multiflora. Branches climbing or trailing: lfts. 5–11, to 1¼ in. long, stipules fringed: fls. white, very fragrant, to ¾ in. across, in many-fld. panicles. Japan. —Source of many garden roses, often double, together with its Chinese ally, *R. cathayensis.* Hardy N.

myriacantha: *R. spinosissima* var.

nitida. To 1½ ft.: lfts. 7–9, to 1¼ in. long, shining above: fls. rose, 2 in. across, solitary or in few-fld. corymbs. Newf. to Conn.

Noisettiana. NOISETTE or CHAMPNEY R. Hybrid between *R. chinensis* and *R. moschata:* to 10 ft.: lfts. 5–7: fls. white, pink, red, yellow, in many-fld. corymbs. Not hardy N. The Maréchal Neil is one of this group.

nutkana. To 5 ft.: lfts. 5–9, to 2 in. long: fls. commonly rose, 2 in. across, solitary. Alaska to Calif. Var. **hispida** (*R. MacDougalii*) has the receptacle glandular-hispid.

odorata. TEA R. Evergreen, branches partially climbing: lfts. 5–7, to 3 in. long, shining above: fls. white, pale pink or yellow, to 3 in. across, solitary or in few-fld. corymbs. China; hardy only far S. Var. **gigantea**, fls. cream, to 6 in. across. Var. **ochroleuca**, fls. pale yellow, double. Var. **pseudindica**, fls. salmon-yellow, double, to 4 in. across.

omeiensis. To 12 ft.: lfts, 9–17, to 1 in. long: fls. white, to 1½ in. across. China. Var. **pteracantha** has prickles much enlarged at base, forming wide rings.

palustris. SWAMP R. To 6 ft.: lfts. commonly 7, to 2 in. long: fls. pink, 2 in. across, in corymbs. N. S. to Fla. and Miss. Var. **Nuttalliana** has larger fls.—This is the rose to which the Linnæan name *R. carolina* was long erroneously applied.

Paulii. Hybrid between *R. rugosa* and *R. arvensis:* procumbent: fls. white, in corymbs.

pendulina (*R. alpina*). To 3 ft.: lfts. 7–9, to 2½ in. long: fls. rose, 1½ in. across, solitary or in few-fld. corymbs. Eu.

Penzanceana. LADY PENZANCE R. Hybrid between *R. fœtida* and *R. Eglanteria:* lfts. 7, fragrant: fls. pink with yellow center.

Pernetiana: see *R. fœtida*, page 537.

persica (*R. simplicifolia*). To 1½ ft.: lvs. simple, to 1¼ in. long: fls. yellow with red center, 1 in. across, solitary. W. Asia; little grown and not hardy N.

pimpinellifolia: *R. spinosissima.*

pinetorum. To 3 ft.: lfts. 5–7, to 1¼ in. long: fls. deep rose, 1½ in. across, usually solitary. Calif.

pisocarpa. To 6 ft.: lfts. 5–7, to 1½ in. long: fls. pink, 1¼ in. across, in corymbs. B. C. to Calif.

Pissardii: *R. moschata* var. *nastarana.*

polyantha. A group of hybrids between *R. multiflora* or *R. cathayensis* and *R. chinensis.*

pomifera: *R. villosa.*

pratincola: *R. suffulta.*

Prattii. To 8 ft.: lfts. 7–15, to ½ in. long: fls. pink, to ¾ in. across, solitary or few-fld. China.

repens: *R. arvensis.*

Reuteri: *R. glauca.*

Roxburghii. To 8 ft., much branched: lfts. 7–15, to ¾ in. long: fls. pale pink, to 2½ in. across, solitary or in few-fld. corymbs. China, Japan. Var. **normalis** has single fls. and var. **plena** double.

rubiginosa: *R. Eglanteria.*

rubrifolia (*R. ferruginea*). To 6 ft., sts. purplish: lfts. 7–9, to 1½ in. long, somewhat purplish: fls. deep red, 1½ in. across, in few-fld. corymbs. Eu.; hardy N.

rugosa. To 6 ft.: lfts. 5–9, to 2 in. long, thick and rugose, shining above: fls. red or white, to 4 in. across, solitary or in few-fld. corymbs. China, Korea, Japan; hardy and durable. Var. **alba**, fls. white. Var. **albo-plena**, fls. white, double. Var. **Chamissonis**, less bristly, lvs. smaller. Var. **kamtchatica**, lvs. thinner, fls. smaller. Var. **rosea**, fls. rose. Var. **typica** (var. *rubra*), fls. purple.

saturata. To 8 ft., scarcely prickly: lfts. mostly 7, to 2½ in. long: fls. dark red, 2 in. solitary. China.

sempervirens. Evergreen, the branches decumbent or climbing: lfts. 5–7, to 2 in. long, shining: fls. white, slightly fragrant, to 2 in. across, in corymbs. Medit. region; to be grown S.

sericea. To 12 ft., prickly: lfts. 7–11, to ¾ in. long, silky-pubescent beneath: fls. white, to 2 in. across, solitary. Himalayas.

sertata. To 6 ft.: lfts. 7–11, to ¾ in. long: fls. rose, 2½ in. across, solitary or in few-fld. corymbs. China.

setigera. PRAIRIE R. To 15 ft., the branches climbing: lfts. 3–5, to 4 in. long: fls. rose fading to white, 2 in. across, in few-fld. corymbs. Ont. to Fla. and Tex.; hardy N., and represented in Baltimore Belle and others. Var. **tomentosa** has lvs. tomentose beneath.

setipoda. To 10 ft.: lfts. 7–9, to 2½ in. long: fls. pink or rose, 2 in. across, in corymbs. China.

simplicifolia: *R. persica.*

sinica: synonym of *R. lævigata.*

sonomensis. To 1 ft.: lfts. 5, to ½ in. long: fls. rose, in many-fld. corymbs. Calif.

Soulieana. To 12 ft.: lfts. mostly 7, to 1¼ in. long: fls. white, 1½ in. across. in many-fld. corymbs. China.

spinosissima (*R. pimpinellifolia. R. illinoensis*). SCOTCH or BURNET R. To 4 ft., densely spiny: lfts. 5–11, to ¾ in. long: fls. white, pink or yellow, to 2 in. across, solitary. Eu., Asia. Var. **altaica** (*R. altaica*), fls. white. Var. **hispida**, fls. sulfur-yellow, to 3 in. across. Var. **lutea**, fls. bright yellow. Var. **luteola**, fls. pale yellow. Var. **myriacantha** (*R. myriacantha*), very prickly, fls. white tinged pink.

spinulifolia. Hybrid between *R. tomentosa* and *R. pendulina.*

spithamea. To 1 ft.: lfts. 3–7, to 1½ in. long: fls. rose, to 1¼ in. across, in few-fld. corymbs. Ore., Calif.

stellata. To 2 ft.: lfts. usually 3, to ¼ in. long: fls. deep rose, to 2 in. across, solitary. Tex., Ariz. Var. **mirifica** (*R. mirifica*), to 4 ft., fls. larger.

subserrulata. To 2½ ft.: lfts. 3–7, sharp-toothed: fls. rose, about 2 in. across, solitary. Mo. to Tex.

suffulta (*R. heliophila. R. pratincola*). To 1½ ft.: lfts. 7–11, to 1½ in. long: fls. pink, 1¼ in. across, in corymbs. Man. to Tex.

Sweginzowi. To 15 ft.: lfts. 7–11, to 2 in. long: fls. rose, 1½ in. across, solitary or in few-fld. corymbs. China.

tomentosa. To 6 ft.: lfts. 5–7, to 1½ in. long: fls. pale pink to white, 1½ in. across, solitary or in few-fld. corymbs. Eu.; escaped in N. Amer.

villosa (*R. pomifera*). To 6 ft., densely branched: lfts. commonly 5–7, to 2 in. long: fls. pink, to 2 in. across, solitary or in few-fld. corymbs. Eu., Asia; hardy N.

virginiana (*R. lucida*). To 6 ft.: lfts. 7–9, to 2½ in. long, shining above: fls. pink or rose, to 2½ in. across, in few-fld. corymbs. Newf. to Va. and Mo. Var. **alba** has white fls.

Watsoniana. Branches partially climbing: lfts. 3–5, to 2½ in. long, very narrow and with entire wavy margins: fls. white or pink, ½ in. across, in many-fld. corymbs. Probably Japan; not hardy far N.

Webbiana. To 6 ft.: lfts. 5–9, to ¾ in. long: fls. pale pink, 2 in. across, mostly solitary. Himalayas to Turkestan.

Wichuraiana. MEMORIAL R. Prostrate or trailing, evergreen: lfts. 7–9, to 1 in. long, shining above: fls. white, fragrant, to 2 in. across, in corymbs. Japan to China; hardy N.—Dorothy Perkins is a derivative of this species.

Willmottiæ. To 10 ft., densely branched: lfts. 7–9, to ½ in. long: fls. rose-purple, 1¼ in. across, solitary. China.

Woodsii. To 6 ft.: lfts. 5–7, to 1¼ in. long: fls. pink or rarely white, 1½ in. across, solitary or in few-fld. corymbs. Sask. to Kans. and Utah. Var. **Fendleri** (*R. Fendleri*) is lower with straight prickles.

xanthina. To 10 ft.: lfts. 7–13, to ¾ in. long: fls. yellow, 1½ in. across, semi-double, solitary. N. China, Korea.

ROSACEÆ. ROSE FAMILY. About 100 widely distributed genera of herbs, shrubs and trees, with mostly alternate lvs., bisexual regular fls. having 4–5 sepals and petals or petals lacking, and 5-many stamens borne on edge of calyx-tube, and fr. an achene, follicle, hip, pome or drupe. The family contains many of the most important fruit plants and ornamentals in the north temp. zone, most of them grown out-of-doors. Genera herein treated are Acæna, Adenostoma, Agrimonia, Alchemilla, Amelanchier, Aronia, Aruncus, Cercocarpus, Chænomeles, Chrysobalanus, Cotoneaster, Cowania, Cratægomespilus, Cratægus, Cydonia, Dalibarda, Dryas, Duchesnea, Eriobotrya, Exochorda, Filipendula, Fragaria, Geum, Gillenia, Heteromeles, Holodiscus, Kageneckia, Kerria, Luetkea, Lyonothamnus, Maddenia, Margyricarpus, Mespilus, Neillia, Neviusia, Osmaronia, Osteomeles, Petrophytum, Photinia, Physocarpus, Potentilla, Poterium, Prinsepia, Prunus, Pyracantha, Pyrus, Quillaja, Raphiolepis, Rhodotypos, Rosa, Rubus, Sanguisorba, Sibiræa, Sorbaria, Sorbaronia, Sorbopyrus, Sorbus, Spiræa, Stephanandra, Stranvæsia, Waldsteinia.

ROSA DE MONTANA: *Antigonon leptopus.*

ROSCHERIA. *Palmaceæ.* Monœcious palm of the Seychelles Isls., sometimes included in Verschaffeltia, but lvs. pinnate except in very young trees, fls. in 2's one of which is pistillate, spathes several and in technical characters. It is seldom seen in American collections. **R. melanchoetes.** Tree to 25 ft., slender, trunk with aerial roots and when young with a ring of spines beneath each lf.-scar: petiole unarmed, the sheath with few black spines; blade of lf. very broad, when young entire except for large notch at apex, on older trees unequally pinnate with broad bifid pinnæ: fr. ¼ in. or less long; albumen ruminate.

ROSE. The species of Rosa are probably 200, widely distributed in the northern hemisphere. A score of them have been much modified under cultivation or have contributed to important hybrids, but even in the crosses the parental resemblances are usually apparent to students of the genus. All members of the genus are important to the horticulturist, to be grown as ornamental shrubbery if not directly for bloom. The well-known horticultural classes, often much modified from the wild state, are chiefly the following:

Bourbons and Hybrid Perpetuals (H. P.) or Remontants, horticultural roses of mixed ancestry of which *R. borboniana* is a prevailing parent; highly developed varieties constituting most of the named roses of gardens, mostly red or red-purple and double, blooming early in the season and again in late summer and autumn from new shoots of the season. For the most part they are hardy in the northern states, particularly if provided protection by mounding in autumn.

Hybrid Teas (H. T.), *R. dilecta*, representing crosses between the Tea and China roses with the H. P. class; less hardy than the H. P.'s but grown out-of-doors in the middle parts of the country (as south of the Ohio) and also under glass.

Tea, China and Bengal roses, *R. odorata* and *R. chinensis.* These are tender roses; they were formerly much grown under glass, but their place has been taken in North America for commercial work by H. T.'s.; they thrive far south, well toward the Gulf.

Noisettes or Champneys, *R. Noisettiana,* good smooth bush roses much grown in warm countries; pink, white. Hybrid offshoots of *R. chinensis.* The Manetti, employed as stocks, is to be associated here or with *R. chinensis.*

The multiflora roses, *R. multiflora* and *R. cathayensis*, represented in the ramblers; plants mostly climbing; white, blush, pink, clustered. Polyanthus roses are of this parentage or hybrids with *R. chinensis.*

Memorial rose, *R. Wichuraiana*, more or less evergreen ground trailer, useful for covering banks, itself white, and now a parent in many popular crosses, as Dorothy Perkins.

Sweetbriers or eglantines, *R. Eglanteria* (*rubiginosa*), in late years with many attractive derivatives, as the Penzance Sweetbrier hybrids. The eglantine itself is a pink single rose run wild in pastures.

Rugosas, strong good-foliaged shrubs; *R. rugosa* itself, from Japan and China, is probably the best of the hardy hedge roses, and the Bruants and other hybrids are attractive varieties.

Austrian brier roses, *R. fœtida*, yellow roses of upright or half-climbing habit; they have provided yellow and coppery colors to various hybrid races, as Harison Yellow and Pernetianas.

Banksia roses, *R. Banksiæ*, a climbing evergreen from China, abundantly used in California and other mild regions for its good foliage and abundance of small clustered white or yellowish somewhat fragrant flowers.

Hugo roses, *R. Hugonis* from China, are yellow-flowered shrubs now becoming popular and entering into hybrids.

Cherokee rose, *R. lævigata* from China and Japan but naturalized in the South, produces white and rose very large single fragrant flowers; it is a strong climbing evergreen.

Macartney roses, *R. bracteata*, evergreen, wide-spreading or partially climbing, naturalized in the southern states, from China; white.

Prairie rose, *R. setigera* and derivatives, variously climbing or needing support; pink; long known in cultivation in Baltimore Belle, and latterly in American Pillar which is a hybrid with *R. Wichuraiana.*

Musk roses, *R. moschata* and *R. Brunonii*; old white-flowered roses, but not now often seen.

Ayreshire rose, *R. arvensis*, white scentless roses, but seen mostly in a double white or pink form which is perhaps a hybrid.

French or Provence roses, *R. gallica*, erect bushes in many varieties, more or less hispid, with solitary pink or crimson flowers, more or less escaped.

Moss and cabbage roses, *R. centifolia* and its derivatives, with double commonly pink flowers; frequent in old yards.

Damask roses, *R. damascena*, with blush or red double roses, strong hardy bushes frequent about old premises.

Dog rose, *R. canina*, good pink or white bush roses, mostly single-flowered; more or less run wild, native in Europe.

Cinnamon rose, *R. cinnamomea,* pink or red commonly double rose, frequently spontaneous and long-persisting about old premises.

Scotch or Burnet rose, *R. spinosissima,* low very prickly bush, with pink, white and yellow flowers, in many forms.

The evergreen roses do not constitute a distinct class. They may be *R. lævigata, bracteata, Wichuraiana, Banksiæ, odorata, sempervirens* and others.

The usual garden roses, in named horticultural varieties, are essentially flower-garden plants, rather than lawn subjects. The flowers are their chief beauty. They have little to commend them in the way of foliage or habit, and they are inveterately attacked by insects and sometimes by fungi. To obtain the best results with these roses, they should be placed in a bed by themselves, where they can be tilled and pruned and well taken care of; and they should be grown as specimen plants, as are other flower-garden plants. The ordinary garden roses should rarely be grown in mixed borders of shrubbery. It seems to be the first desire of the home-maker, when he considers the planting of his grounds, to set out garden roses; yet they should not be undertaken until the land is well chosen and properly fitted, with prospect of as good attention as is given to the best garden vegetables and fruits.

For roses in mixed borders the single and informal types should be chosen. One of the best is *R. rugosa.* This has not only attractive flowers through the greater part of the season, but it also has interesting foliage and a striking habit. The great profusion of bristles and spines gives it an individual and strong character. Even without the flowers, it is valuable to add character and cast to a foliage mass. The foliage is not much attacked by insects or fungi, but remains green and glossy throughout the year. The fruit is also large and showy, and persists well through the winter. Some of the wild roses are also excellent for foliage masses, but, as a rule, their leafage characteristics are rather weak, and they are liable to be attacked by thrips. Many recently introduced species have increased the list of shrubbery roses.

Roses have no special or exclusive requirements as to land. Good firm fertile garden soils should give satisfactory results. Clay lands are acceptable if well enriched and drained. While roses may be planted closely in beds and borders, the surface should be tilled if highly developed flowers are to be produced; and in the blooming season a moisture-retaining mulch usually gives excellent results. The stronger soils, with a clay basis or content, are generally preferred for the H. P. (Hybrid Perpetual) class and for the stronger H. T. (Hybrid Tea), but lighter lands are usually recommended for the weaker H. T., La France and some others. Soils of a clayey character are likely to produce better results in autumn bloom. Special classes and varieties of roses require particular soils for the highest results, and the rose specialist will give detailed attention to these refinements of the practice.

For the growing of the horticultural roses for best bloom, the location and exposure should be as good as for any other high-class crop. The rose garden should be away from trees that shade it and that send their roots underneath the beds, and also at good distance from eaves and the shadows of buildings. It is better to place the beds at the rear or side of the residence rather than in front, where they may be tilled, manured, protected for winter and otherwise sufficiently looked after. In any case, the beds must be thoroughly underdrained naturally or artificially, and the available soil should be deep and provide plenty of root room. Beds should be at least 3 feet wide, and 4 feet for strong growers; if less than 3 feet, then only one row should be planted in the middle.

Distances for planting roses naturally vary with the kinds and the particular purposes for which they are grown. Shrubbery roses may be allowed 3 feet square. Roses that are pruned back to canes and do not make permanent bushes or shrubs, as H. P.'s, may be set 18 to 30 inches apart either way, alternating if in rows. Vigorous kinds may need staking, and tying with soft cord.

Time of planting out-of-doors varies with the region and also the nature of the plants. Strong field-grown stock may be set early in autumn, as soon as leaves fall, but plants not fully ripened or mature should be set only in spring and preferably when dormant. In its second year, a strong rose bush should produce throughout the season something like fifteen to forty or fifty blossoms.

Pruning is essential for the production of large flowers suitable for cutting. Wood that bears good roses is short-lived. Pruning, therefore, depends on the blooming habit; no person is qualified to prune roses until he knows whether the flowers are borne from old canes or trunks, or mostly on long new canes or shoots of the season. Most of the common garden roses bloom best on new canes arising from the base of the plant or from new shoots springing from year-old wood: the purpose, therefore, is to produce a few good strong clean canes from a distance of a foot or so above the crown. It is customary to cut away old and weak canes in autumn, leaving four or five of the best ones for the next year renewals. These reserved canes may be cut back to 2½ or 3 feet in autumn to protect the plants from swaying and breaking in winter storms; and in spring they are again cut back to fresh green wood, leaving on each cane four to six good buds from which new blooming shoots are to arise; this means that the canes may be cut back three-fourths of their length. After the early or June bloom, the strong canes may be cut back again to stimulate new shoots for autumn bloom, but severe summer pruning may produce too much leafy growth. Weak- or slender-growing kinds may be pruned more severely than the strong vigorous kinds. The H. T.'s are ordinarily cut down lower in autumn and given good protection in the North. By bringing out new canes from near the base of the plant, long-stemmed roses may be obtained. The shrub kinds, as sweetbriers, rugosas, austrians, may be pruned by merely shortening them somewhat to keep them within bounds and by removing weak and dead wood; but new canes should be encouraged from the crown to take the place, as needed, of old weak and spent trunks. Climbing roses should have the dead wood and over-vigorous branches removed but much pruning is to be avoided; and new canes should be saved and tied up to keep the plant in a process of renewal.

Winter protection in the North is provided by hilling up the plants with earth to a height of 6 inches or more in late autumn, also by laying down tender climbers and tree roses much the same as grapes are protected on the northern limits of their cultivation.

Propagation of roses may be by means of stratified seeds for the native and unmodified kinds but it is commonly accomplished by cuttings and grafting, sometimes by layers. Roses grown under glass for bloom were formerly propagated by greenwood cuttings 2 or 3 inches long taken in October to December and placed in sand. Late in winter they are ready for potting, and should make plants strong enough for setting in greenhouse benches in July to September for blooming the coming winter. Roses under glass are now wanted for earlier bloom, the plants being set in the benches early in June, and for this purpose grafted plants are employed. Manetti stock is imported, and grafting is performed about January. The stocks are potted in about 2½-inch rose-pots as soon as received, and then splice- or whip-grafted just above the earth. The cion is a short one-joint cutting of firm green wood of the desired variety, with part of a leaf attached. The graft is tied but not waxed. Some propagators set the stock rather low in the pot and then fill with earth around the union; others do not cover the part. The pots are then placed in a propagating frame at high temperature; plants are repotted as needed, and should be in 4-inch pots when ready to go in greenhouse benches in June. Strong plants under good conditions should give bloom in September. Plants may be cropped or bloomed two or three years under glass.

Roses for outdoor planting may be own-rooted (grown from cuttings) or worked on other stock by budding or grafting. Formerly roses "on their own roots" were preferred, but with the greater experience of the present day and the better understocks now available, the budded or grafted rose plant is now most popular. In setting grafted or budded plants, pains must be taken to place the union 3 or 4 inches below ground to prevent breakage and to discourage suckers from the stock; and the grower should remove every such sprout that arises. Dog-rose stock (*Rosa canina*) is much employed in Europe but is now little known in North America. In the East the prevailing understock for outdoor use is a form of Multiflora; in California Manetti and others are considered to be preferable. Rugosa is also employed as understock in the East. Far south other stocks are in use.

The production of new varieties of the hybrid roses, particularly in the H. P. and H. T. classes, has become a highly specialized undertaking and certain persons and firms have gained great reputation in this field. There are now roses adapted to outdoor growing in every part of North America where pomological fruits of one kind or another can be raised. A brief list of varieties would be of little service for the whole country. Intending rose-growers may now have good counsel on varieties for their region and their purposes from nurserymen, experiment stations, bulletins, and they may apply to the rose societies and garden clubs.

Certain insects and diseases are partial to roses. The summer insects are often successfully treated by a forceful spray of clear water, early in the day and again at evening. Those having city water or good spray pumps will find this an easy method of keeping rose pests in check. Nicotine preparations supplied in a spray may be employed for aphis, thrips, and some other insects, and arsenate of lead for chafer. Black Leaf 40 is also effective. Black-spot and canker are to be treated with sulfur, although the latter disease is not readily controlled but cutting out affected canes will help. A general program for rose diseases is to spray with liquid lime-sulfur in late autumn after leaves fall and again in spring; then follow with sulfur or green-sulfur dusting in summer.

In greenhouses greenfly is kept down with nicotine fumes and also by cyanimid scattered on the walks. It is important that disease-free stock be set in the greenhouse, that all refuse has been removed and burned, and that such attention be given to soil, ventilation and watering as will fortify the plants against fungous injury.

Rose-growing in winter requires special experience and skill for commercial results, but considerable satisfaction may be obtained in home conservatories and window-gardens. For growing under glass, gardeners usually provide raised beds, in the best-lighted houses. The bottom of the bed or bench is provided with drainage; the bench is then covered with 4 or 5 inches of fresh fibrous loam. This is made from rotted sods, with decayed manure incorporated at the rate of about one part in four. Sod from any drained pasture-land makes good soil. The plants are set on the bed in the spring or early summer, from 12 to 18 inches apart, and are grown there all summer to be ready for the winter. In the winter they are kept at a temperature of 58° to 60° at night, and 5° to 10° warmer in the day. The greatest care is required in watering, in guarding the temperature and in ventilation. Draughts result in checks to the growth and in mildewed foliage. Dryness of the air, especially from fire heat, is followed by the appearance of the minute red-spider on the leaves. The aphis, or green plant-louse, appears under all conditions, and must be kept down by syringing with tobacco-tea or fumigation with tobacco stems or special preparations. These suggestions may be applied to the growing of a rose bush or two in a box or large pot for the window.

ROSE, BRIDAL-: *Matricaria inodora* var. *plenissima.* **Brier-**: *Rubus coronarius.* **California-**: *Convolvulus japonicus.* **Christmas-**: *Helleborus niger.* **Confederate-**: *Hibiscus mutabilis.* **Cotton-**: *Hibiscus mutabilis.* **Guelder-**: *Viburnum Opulus* var. *roseum.* **-Mallow**: *Hibiscus.* **-Moss**: *Portulaca grandiflora.* **-of-China-**: *Hibiscus Rosa-sinensis.* **-of-Heaven**: *Lychnis Cœli-rosa.* **-of-Jericho**: *Anastatica hierochuntica.* **-of-Sharon**: *Hibiscus syriacus.* **Rock-**: *Cistus.* **Sun-**: *Helianthemum.*

ROSELLE. An annual hibiscus, *H. Sabdariffa*, sometimes grown in the warmest parts of the United States and in the tropics for the large thick acid calyx and bracts that are prized in the making of jams, sauces, jellies and acid drinks. It is grown like tomatoes or eggplants. Rows are ordinarily spaced for horse tillage, and plants may be set therein 18–24 inches apart. The plants reach 4 or 5 feet or more in height, making a continuous line or hedge. The bolls or heads are picked when immature, before becoming woody, and utilized either fresh or after being dried. There are yellowish forms of roselle, but in the usual kind the bolls are red. The plant is known also as Jamaica sorrel.

ROSEMARY: *Rosmarinus.* **Bog-**: *Andromeda.* **Wild**: *Ledum palustre.*

ROSENBERGIA: *Cobœa.*

ROSEOCACTUS. *Cactaceæ.* Recent segregate from Ariocarpus, technically defined by the fls. arising from an areole concealed in a longitudinal cleft in the tubercle: very succulent plants with a turnip-like root and flat or hemispherical body bearing thick spirally disposed tubercles: fls. from the center of the plant, opening in sun and of short duration. See *Cacti.*

fissuratus (*Anhalonium fissuratum. Ariocarpus fissuratus. Mammillaria fissurata*). Living Rock. Plant body flattish or somewhat rounded, mostly buried, to 5 or 6 in. across; tubercles grooved on upper side, the triangular surface showing a deep linear impression following the outer margins: fls. white to purple, to 1½ in. across. W. Tex., Mex.

Kotschoubeyanus (*Ariocarpus Kotschoubeyanus* and *A. sulcatus*). Plant 2 in. or less across, only the flat top above ground; tubercles grooved on upper side, the triangular surface slightly rough: fls. about 1 in. long, rose-colored to light purple, arising near the top of the tubercle. Mex.

Lloydii (*Ariocarpus Lloydii*). Body with rounded top, 4 in. or more diam.; tubercles without a linear depression along the margin, exposed end broadly rhomboid rather than triangular: fls. purple, slightly above 1 in. long. Cent. Mex.

ROSEROOT: *Sedum roseum.*

ROSINWEED: *Silphium.*

ROSMARINUS. Rosemary. *Labiatæ.* A hardy evergreen subshrub with small fls. in short axillary racemes, a well-known sweet herb grown for its aromatic lvs. which are used in seasoning while their volatile oil is common in drug-stores. Rosemary lasts for years if given well-drained soil and some winter protection. It is useful in S. Calif. for hedges, especially along the coast where it is dry and rocky. **R. officinalis.** To 6 ft.: lvs. linear, ¼ in. long, revolute, dark and shining above, white-tomentose beneath: fls. in short axillary racemes, light blue, ½ in. long, Apr.–May. Medit. region. Var. **prostratus** is prostrate.

ROTATE: wheel-shaped; with short or obsolete tube and a flat and circular limb.

ROTUND: nearly circular; orbicular inclining to be oblong.

ROUGE-PLANT: *Rivina humilis.*

ROUPALA. *Proteaceæ.* Trop. American trees with alternate leathery lvs., bisexual fls. in pairs borne in racemes, and hard capsular frs.; differs from Hakea and Grevillea chiefly in seed characters. Sometimes grown under glass, and out-of-doors in S. Calif.

corcovadensis: *R. Pohlii.*

Pohlii (*R. corcovadensis*). To 30 ft. or more, branches rusty-tomentose: lvs. with 5–8 pairs of ovate or oblique toothed lfts. to 5 in. long: fls. white or yellowish, in racemes to 5 in. long. Brazil.

ROWAN: *Sorbus Aucuparia.*

ROYENA. *Ebenaceæ.* Evergreen African trees or shrubs with entire lvs., small usually solitary fls., and fr. a leathery berry; one species grown out-of-doors in S. Calif. and sometimes under glass.

lucida. To 12 ft. or more: lvs. alternate, oval, to 2 in. long, shining above: fls. white or yellowish, to ⅓ in. long: fr. red or purple, to 1 in. long. S. Afr.

ROYOC: *Morinda Royoc.*

ROYSTONEA. Royal Palms. *Palmaceæ.* A few monœcious columnar unarmed feather-palms of American tropics of striking appearance and much planted in trop. countries around the world and in S. Fla.: trunk solitary, tall, cylindrical or variously bulged, more or less ringed: lvs. regularly pinnate, long and large, handsomely arching and drooping: spadices arising from top of trunk at base of sheath-column, much branched, shorter than lvs.: fls. in 3's, the middle one pistillate, or in 2's and staminate toward ends of branches; stamens mostly 6: fr. globose or oblong, ⅜ to ¾ in. long, 1-seeded. See *Palm* for cult.

borinquena (*Oreodoxa* and *R. caribæa*). Porto Rico Royal Palm. Trunk to 50 ft. and more, fusiform or swollen in the upper part and thence tapering to the infl.: lvs. to 10 ft. long; pinnæ many, to 2½ ft. long, nearly 2 in. or less broad, long-tapering to the point; stamens covered in the bud: fr. ovoid, yellowish-brown, about ½ in. long and ⅜ in. thick. Porto Rico, St. Croix; sometimes planted elsewhere.

caribæa: *R. borinquena.*

floridana: *R. regia.*

oleracea (*Oreodoxa oleracea*). Barbados Royal Palm. Noble slender tree reaching 100 ft. and more: trunk commonly swollen at base and then cylindrical: lvs. ascending or horizontally spreading so that the crown is more or less flat on the bottom; pinnæ in a single row on either side the rachis: spadices far below the crown and therefore conspicuous; stamens protruding in the bud: fr. oblong, ½–⅝ in. long and ⅜ in. thick, often somewhat curved. Farther W. Indies; much and widely planted.

princeps (*Oreodoxa princeps*). Jamaica Royal Palm. To 50 ft.: pinnæ 2½ in. broad near the middle, 3 ft. and more long, acuminate; rachis dotted with minute rusty scales: spadix much branched, the branches very slender; staminate fls. small, the stamens covered in the bud: fr. large, globose-ovoid, not quite symmetrical, about ¾ in. long and ½ in. thick. Jamaica; little if at all known elsewhere.

regia (*R. floridana. Oreodoxa regia*). Cuba Royal Palm. To 70 ft. or perhaps more, the trunk swollen somewhat at or above the middle and then tapering: crown bushy and the lower lvs. drooping and covering the rather short spadices; pinnæ in 2 rows or directions on either side the rachis; stamens covered in the bud: fr. globose or globular-oblong, ⅜–½ in. long. Cuba, and reported on other isls. and from Panama; S. Fla. on isls. in Everglades; much planted in S. Fla.

RUBACER: *Rubus odoratus.*

RUBBER, PARA: *Hevea brasiliensis.* **-Plant:** *Ficus elastica.* **-Tree, Mexican:** *Castilla elastica.* **-Vine:** *Cryptostegia.*

RUBIA. *Rubiaceæ.* Per. herbs with mostly whorled lvs. and small wheel-shaped 5-lobed fls. in cymes; of wide distribution, one sometimes cult. for the root which yields a dye.

tinctorum. Madder. To 4 ft., erect or decumbent: lvs. in 4's–6's, lanceolate, to 4 in. long, prickly on midribs and edges: fls. greenish-yellow, in branching cymes: fr. red turning black. S. Eu., Asia.

RUBIACEÆ. Madder Family. A large group of about 350 genera of herbs, shrubs and trees, sometimes climbing, abounding in ornamental subjects: lvs. simple, opposite or whorled: fls. usually bisexual with gamopetalous 4–5-lobed corolla, 4–5 stamens, inferior 1–10-celled ovary: fr. a caps., berry or drupe. The family furnishes many economic plants such as coffee and quinine, as well as dyes and medicines. The genera known to hort. are Asperula, Bouvardia, Catesbæa, Cephaelis, Cephalanthus, Chiococca, Cinchona, Coccocypselum, Coffea, Coprosma, Coutarea, Crucianella, Duggena, Emmenopterys, Galium, Gardenia, Genipa, Hamelia, Hoffmannia, Houstonia, Isertia, Ixora, Leptodermis, Luculia, Manettia, Mitchella, Morinda, Nertera, Palicourea, Pentas, Portlandia, Posoqueria, Psychotria, Richardia, Rondeletia, Rubia, Serissa, Tricalysia, Warszewiczia.

RUBUS. Brambles. *Rosaceæ.* Shrubs, seldom nearly herbaceous, often with bien. canes (fruiting the second year and then perishing), most of them prickly, including the blackberries, dewberries, raspberries grown for fruit and also a good number of species planted for the showy flowers and ornamental foliage; there are many species around the world, mostly in the northern hemisphere. Lvs. alternate, prevailingly compound but sometimes simple: fls. white or pinkish or rose, in the cultivated species mostly in clusters: fr. an aggregate of small drupes; when the cone or thimble of cohering drupelets parts from the receptacle when picked, it is a raspberry, the receptacle remaining on the bush; when the drupelets adhere to the receptacle it is a blackberry or dewberry, the receptacle being eaten as part of the fruit. The dewberries differ from blackberries only in being vines, running over the ground or when planted needing support. The kinds of rubus are difficult of determination, and only the more marked cultivated species (or forms) are entered here. When named pomological vars. are listed under a species, it is meant they are derivatives from it directly or indirectly and may not typically represent it. The nomenclature of the native species is likely to undergo considerable change on the completion of present studies.

The brambles are of simple culture. The canes of blackberries and raspberries should be removed at the ground after fruiting and opportunity given for the new ones to develop. An open exposure and average garden soil are suitable. They grow readily from seeds, but the usual method of propagation is by root-cuttings or by suckers; some of them increase naturally by the new canes taking root either at the joints or at the recurving tip. See *Blackberry*, *Dewberry*, *Raspberry.*

acuminatus. Ornamental scandent shrub: lvs. simple, ovate-oblong, caudate-acuminate, serrulate; fls. white, small, in fascicled racemes. Himalayas.

allegheniensis (*R. nigrobaccus. R. sativus*). Glandular highbush blackberry: erect or at length somewhat arching, to 10 ft., with hooked prickles: lfts. 3 or 5, ovate or oblong-ovate, long-pointed, soft-pubescent underneath: infl. elongated: fr. mostly long or oblong, sweet and aromatic. Common, N. S. to N. C. and Mo.—Taylor, Snyder, Ancient Briton, Agawam represent the species more or less closely. In dry open lands the wild plant may remain as low as 1 or 2 ft.

Andrewsianus: see *R. argutus.*

argutus. Non-glandular highbush blackberry, erect or becoming arching or in woods more or less decumbent, to 8 ft. or more, stiff and upright in the open: lfts. 3 or 5, mostly oval to oblong or lance-ovate, commonly soft-pubescent underneath, the petioles and infl. essentially glandless: infl. short: fr. rather small, short-oblong. New England to southern states and west to Miss. River and beyond.—Probably has given rise to pomological vars. *R. Andrewsianus* and *R. floricomus* are similar, their identity not yet recognized.

aurantiacus: see *R. ellipticus.*

australis. Lofty tree climber, diœcious; branches slender and drooping, recurved-prickly: lfts. usually 3 or 5, variable, narrow-ovate or narrower, to 5 in. long. glabrous or sometimes tomentose underneath, sharp-serrate: fls. white, to ½ in. diam.: fr. reddish-orange, ¼ in. diam. New Zeal.—Adapted only to warmer parts and sometimes seen under glass. Var. **glaber** is the glabrous or smooth form.

bambusarum: *R. Henryi* var.

cæsius. European Dewberry. Weak plant with long-prostrate slender rooting glaucous canes, making large colonies, prickles not stout and mostly or often straight, sts. and fl.-clusters with few or no glands: lfts. normally 3, broad-ovate: fls. white, few in open cluster: fr. of a few large glaucous drupelets and the sepals mostly erect. Eurasia.—Planted as ground-cover and sometimes spontaneous.

canadensis (*R. Millspaughi*). Glandless highbush essentially glabrous blackberry, spineless or nearly so, to 8 or 12 ft., the canes at length somewhat arching: lfts. 3, 5 or seldom 7, ovate to narrow-ovate and long-acuminate, sharp-serrate: infl. elongated: fr. oblong to roundish, mostly sour. Abundant northward, ranging from Newf. to the mts. of N. C.—Probably not in cult. outside botanical collections except as a transplant; the thornless blackberries of cult. are *R. ulmifolius* var. *inermis*, *R. titanus* var. *espinatus*, or occasional variants of other species.

carpinifolius: *R. continentalis*.

Chamæmorus. Cloudberry. Monœcious or diœcious: st. nearly or quite herbaceous, 3–10 in. high, from a creeping rootstock: lvs. 2 or 3, rounded in outline and obtusely lobed: fl. solitary, white, to 1 in. across: fr. reddish or yellow. Arctic and subarctic regions around the world, south to mts. of Me. and N. H.—Useful in rock-garden.

Commersonii: *R. rosæfolius*.

continentalis (*R. carpinifolius*). Trailing, prickly, hispid and glandular dewberry: differs from *R. trivialis* in broader not persistent simply dentate or notched lfts.: fls. often on elongated shoots: fr. globose or conical, black. Md. to Tex.—The Manatee dewberry perhaps belongs here.

coronarius (*R. rosæfolius* var. *coronarius*). Brier-Rose. Smaller stature than *R. rosæfolius*, young parts and lvs. glabrous and strongly resinous-dotted, prickles much more numerous and very stout, lfts. relatively small, not prominently acuminate and mostly narrowed at base: fls. full double, white, 1 in. or more across. Probably Asian; cult. and more or less wild in Calif. and tropics.

cratægifolius. Upright, to 10 ft., prickly: lvs. cordate-ovate to oblong-ovate, with 3 or 5 acute toothed lobes, mostly slightly hairy underneath: fls. white, ½–¾ in. across, in small clusters: fr. small, orange-red. China, Japan.—Sometimes planted to cover banks and for its good autumn foliage; hardy N.

cuneifolius. Sand Blackberry. Stiff and erect, 1–3 ft., branched, strongly armed: lvs. white-pubescent underneath; lfts. 3 or 5, mostly obovate, dentate, obtuse or short-acute: fls. white or pinkish, few in a cluster: fr. blackish, oblong, good. Sands, Conn. to Fla.—Useful for cover on poor lands.

Dalibarda: *Dalibarda repens*.

deliciosus (*Bossekia deliciosa. Oreobatus deliciosus*). Boulder Raspberry. Rocky Mountain Flowering Raspberry. Upright, to 6 ft. or more, spreading and arching, unarmed: lvs. orbicular-ovate to reniform, with 3 or 5 broad shallow lobes: fls. white, mostly solitary, to 2 in. across, in spring and early summer: fr. dark purple or wine-red. Canyons, Colo.—Grown for the rose-like fls.; hardy N.

dumetorum. European Dewberry. Stout plant, sometimes glaucous, clambering and long-running, with rooting branches, prickles commonly stout and hooked, st. and panicle strongly glandular: lfts. 3–5, the stipules narrow: fls. mostly in long regular and compound hairy panicles: fr. of several or many drupelets not glaucous, sepals often spreading. Eu.—Plants grown under this name may be *R. cæsius*.

ellipticus (*R. flavus*). Clambering semi-climbing strong evergreen to 10 or 15 ft., sts. densely reddish or brownish hairy and with stout prickles: lfts. 3, oval or elliptic or broader, obtuse or short-acute, serrate, gray-tomentose underneath: fls. white, in panicles: fr. yellow. India.—Grown in Calif. and similar climates for ornament and sometimes naturalized in tropics; has been planted as *R. aurantiacus*.

flagellaris (*R. procumbens*). American Dewberry. Trailing, rooting at tips, not glandular, with recurved prickles: lfts. 3 or 5, ovate to triangular-ovate, acute to acuminate, serrate-dentate: fls. few in a forking infl.: fr. spherical to oblong, black, edible. Canada to the Gulf, occasionally planted.—Sometimes known as *R. villosus*. Var. **geophilus** (*R. geophilus*). Lvs. very large, cut-toothed. Probable origin of the Mayes or Austin and similar dewberries. Var. **invisus** (*R. invisus*). Sts. strongly ascending and not very prickly, lfts. on new canes regularly ovate and simply toothed. Origin of Bartel and General Grant dewberries. Var. **roribaccus**. Robust; lfts. cuneate-obovate and doubly serrate, pedicels very long, to 6 in., fls. and fr. very large; Lucretia dewberry.

flavus: *R. ellipticus*.

floricomus: see *R. argutus*.

Fraseri (*R. robustus*). Cross between *R. parviflorus* and *R. odoratus*: to 8 ft., less glandular-hairy than *R. odoratus*: fls. rose-color fading to pale purple. *R. parviflorus* var. *Fraserianus* is a different plant.

frondosus (*R. philadelphicus*). Non-glandular highbush blackberry, at length over-arching, with short recurving prickles: lfts. mostly 3, short-ovate, acute, dentate or serrate: fls. in a short leafy cluster: fr. spherical or nearly so, black, sweet. Mass. to Va. and Mo.—Perhaps the source of some of the short-cluster pomological blackberries.

fruticosus: an old name for shrubby blackberries of Eu., now mostly abandoned as a name for a particular species.

geophilus: *R. flagellaris* var.

Giraldianus. Raspberry grown for ornament: sts. white-glaucous, somewhat prickly: lvs. white-tomentose underneath; lfts. 7–9, oblong-lanceolate and terminal one much broader, serrate: fls. purplish, small, in narrow terminal panicles 4–6 in. long. China.

glaucus. Raspberry with glaucous somewhat prickly canes: lfts. 3, lanceolate or ovate-lanceolate, long-acuminate, serrate, white-tomentose underneath: fls. white, in short terminal racemes. Costa Rica to Ecuador.

Henryi. Climbing evergreen, with sts. tomentose when young and few prickles: lvs. deeply 3–5-lobed, white-tomentose underneath, the segms. or lfts. long and narrow, to 6 in. long and 1 in. broad: fls. pink, ¾ in. across, in glandular racemes. China. Var. **bambusarum** (*R. bambusarum*) has 3 narrow short-stalked lfts. to 4 in. long.

hispidus. Swamp Dewberry. Slender hispid and often glandular trailer, lying close on the ground, without prickles, foliage glossy and mostly evergreen: lfts. mostly 3, obovate and obtuse: fls. small, few: fr. black at full maturity, sour. Swamps and low places, Canada to Ga. and Kans.—Sometimes grown as ground-cover.

idæus. European Raspberry. Erect, 3–5 ft. or more, prickles many, few or none, sometimes bristly but not glandular, propagating by suckers: lfts. 3 or 5, ovate to broad-ovate, dentate, grayish- or whitish-pubescent underneath: fls. whitish, few and small: fr. oblong, conical or thimble-shaped, mostly dark red but sometimes yellow or whitish. Eurasia, seldom northward in N. Amer.—A few of the pomological vars. belong here. Var. **strigosus** (*R. strigosus*). Common or American Red Raspberry. More hardy: infl. and sometimes new canes bristly and glandular: fr. light red, hemispherical to conical, soft. Newf. to N. C., Wyo. and B. C., and E. Asia. Source of the common named red raspberries, sometimes yellow.—The purple-cane raspberries (*R. neglectus*), frs. mostly purplish, are hybrids of *R. idæus* var. *strigosus* and *R. occidentalis*; plants propagated either by suckers or tips.

illecebrosus. Strawberry-Raspberry. Canes glabrous, woody or nearly herbaceous from spreading roots forming patches, with curved prickles, to 4 ft. long and more or less lopping: lfts. 5–9, narrow-lanceolate and acuminate, to 4 in. long: fls. white, fragrant, few or solitary, to 1¾ in. long, with very long sepals: fr. large, scarlet, sour. Japan.—Root-hardy N.; planted for ornament, fr. pleasant when cooked. It has been known also as balloon-berry.

inermis: *R. ulmifolius* var.

innominatus. Canes densely glandular-hairy, erect, to 10 ft., prickly (in var. **Kuntzeanus** glandless): lfts. 3 or 5, oblong-ovate, serrate, white-tomentose underneath, to 4 in. long: fls. small, pink, in narrow panicles: fr. orange-red, edible. China.—Sometimes grown for ornament and interest, root-hardy N. The Van Fleet raspberry, promising pomological variety for the S., is a hybrid of *R. innominatus* (probably var. *Kuntzeanus*) × *R. idæus* var. *strigosus* (Cuthbert).

invisus: *R. flagellaris* var.

irenæus. Prostrate more or less shrubby evergreen, st. tomentose and with or without prickles: lvs. simple, nearly orbicular, cordate, often acute, to 6 in. across, white- or rusty-tomentose underneath: fls. white, to ¾ in. across, solitary to few: fr. red. China; not hardy N.

laciniatus. Cutleaf or Evergreen Blackberry. Strong more or less evergreen hardy blackberry with tumbling or trailing prickly per. canes becoming glabrous: lfts. 3 or 5, cut into very narrow acute toothed parts: fls. white or pink, in large panicles: fr. small to medium, spherical or nearly so, black. Eu., run wild in many parts of the world as on the Pacific Coast.—There are a few pomological vars., as Starr, Wonder.

laudatus. Tall erect non-glandular blackberry with furrowed canes becoming glabrous and straight or retrorse prickles: lfts. 3 or 5, obovate-oblong to oblanceolate to ovate, acuminate, serrate: fls. white, in a short leafy cluster: fr. oval, black, sweet, early. Cultigen, perhaps an offshoot of *R. argutus:* Bundy and Kenoyer blackberries.

leucodermis (*R. occidentalis* var. *leucodermis*). Differs from *R. occidentalis* in yellowish canes, more strongly recurved and flatter prickles, lfts. yellowish-green above, less acuminate, more strongly and sharply toothed, fr. reddish or black, edible. B. C. to Calif., Mont., Utah.

leucostachys. BROADLEAF EVERGREEN BLACKBERRY. Stout and very prickly, more or less evergreen, with long arching or prostrate densely felted per. often glandular canes: lfts. 5, broad-ovate to nearly orbicular, short-acuminate, sharply dentate, yellowish- or grayish-felted underneath: fls. white or pink, in large villous panicles: fr. rather large, globose, black, sweet but insipid. Eu.; sometimes planted, and escaped on Pacific Coast.

Linkianus: name of uncertain application; perhaps *R. probabilis* may be meant in some cases.

loganobaccus. LOGANBERRY. PHENOMENAL. Robust and vigorous blackberry, canes glaucous, with many straight prickles, long and vine-like: lfts. 3 or 5, thick, large, broad-ovate, acute, dentate, gray-tomentose underneath: fls. bisexual, white, to 2 in. across (sometimes double), in short open clusters: fr. long, to 1¼ in., red, acid. Cultigen; probably offshoot of *R. ursinus* or cross between that species and red raspberry.

louisianus. Erect non-glandular blackberry with scattered prickles, canes becoming glabrous with age; distinguished by the very narrow lfts. (narrowly lanceolate and long-pointed), to 4 in. long, sharp-serrate: fls. white, in open leafy clusters: fr. cylindrical, white or nearly so. U. S.—Perhaps an offshoot of *R. argutus:* known in the pomological varieties Crystal White and Iceberg.

macrocarpus. Branches, infl. and petioles glandular and villous, with hooked prickles: lvs. simple, lobed or ternate; lfts. thick, ovate or broad-elliptic, serrate: fls. purple, large, somewhat panicled: fr. large, long. Mts., Ecuador.

macropetalus. Blackberry or dewberry, at first ascending, becoming procumbent or vine-like, plant not tomentose, canes slender and glaucous, with weak prickles: lfts. 3, green both sides, thin, most of them acuminate or pointed, very sharply toothed: fls. unisexual or imperfect, white, variable in size, in short clusters, pedicels and large calyx with stalked glands: fr. glabrous, black. N. Calif. to B. C.—Has given rise to pomological vars.; often confused with *R. ursinus.*

Millspaughi: *R. canadensis.*

mirus. Decumbent or clambering, with stout prickles but no bristles or glands, the pedicel prickles also long and prominent: lfts. on new shoots ovate or elliptic, more than half as broad as long: fls. white, very large, commonly more than 1 in. across: fr. 1 in. or more long, black, of good quality. Cultigen.—The Marvel dewberry belongs here.

moluccanus. Robust, raspberry-like, tomentose and red-hairy, with curved prickles: lvs. simple, tomentose underneath, usually broad-ovate and deeply cordate, more or less 3–5-lobed: fls. white, in terminal clusters. India, Malaya.

neglectus: hybrid of red and black raspberries; see *R. idæus.*

nigrobaccus: *R. allegheniensis.*

nutkanus: *R. parviflorus.*

occidentalis. BLACKCAP RASPBERRY. THIMBLEBERRY. Erect, 3–5-ft., with glaucous prickly canes that bend over and root at the tip: lfts. mostly 3, ovate-acuminate, doubly dentate, white-tomentose underneath: fls. small, whitish, in dense short prickly clusters: fr. hemispherical, black and glaucous, firm, seldom varying to amber. N. B. to Ga., west to Minn. and Colo.—The source of many pomological varieties of black raspberry.

odoratus (*Rubacer odoratum*). FLOWERING RASPBERRY. Unarmed, erect, with shredding bark, to 6 ft., forming colonies: lvs. simple, large, broad-ovate, cordate, 3–5-lobed, finely serrate, pubescent underneath: fls. to 2 in. across, rose-purple (varying to whitish), many in loose clusters: fr. red, flat, dry, not eaten. N. S. to Mich. and Ga.—Sometimes planted for ornament.

palmatus. MAYBERRY. Diffuse and rather slender, to 7 ft., glabrous, with scattered prickles: lvs. simple, triangular-ovate to oblong-ovate, to 3½ in. long, deeply lobed toward base, sharply lobed-dentate, acuminate, somewhat pubescent on veins underneath: fls. white, to 1 in. across, solitary: fr. yellow. China, Japan.—Has been intro. for fr. in mild climates; sometimes planted for ornament and root-hardy N. with protection.

paniculatus. Scandent, white-tomentose on branches and under side of lvs. which are simple but sometimes lightly lobed, cordate-ovate, to 6 in. long, acuminate, serrate: fls. medium size, in large panicles. Himalaya.

parviflorus (*R. nutkanus*). Much like *R. odoratus,* but fls. fewer and white. Mich. to Mex. and Alaska. Var. **Fraserianus** has laciniate-toothed petals.

philadelphicus: *R. frondosus.*

phœnicolasius. WINEBERRY. Canes long, recurving and rooting at tip, with weak nearly straight prickles and covered with red-brown glandular hairs: lfts. usually 3, broadly cordate-ovate, dentate, purplish-veined and white-tomentose underneath: fls. small and whitish or pink, in close clusters, the large calyx bristly: fr. bright red, small, edible. China, Japan, sometimes escaped.—Ornamental.

probabilis. TREE BLACKBERRY. Stout, stiff very prickly plant, erect and diffusely branching, canes nearly or quite glabrous except near the tip: lfts. 3 or 5, oblong to slightly obovate, acute, sharp-toothed, stiff but not evergreen, more or less white-tomentose underneath: fls. in short prickly clusters: fr. globular to oblong, mostly juicy and sweet. Md. to Fla.—Represented formerly in cult. by the pomological var. Topsy (or Tree), now by Robinson and Nanticoke; range and origin of *R. probabilis* are undetermined.

probus. QUEENSLAND RASPBERRY. Erect or somewhat drooping at maturity, 6–8 ft., producing suckers, canes glabrous and with few short spines: lvs. pinnate, glabrous; lfts. 3–9, ovate-lanceolate and gradually acuminate, sharply double-serrate, terminal one to 4 in. long: fls. white, solitary or clustered, long-pedicelled, calyx not elongated: fr. red, depressed endwise. Known only as a cultigen, said to be a hybrid from Queensland, *R. rosæfolius* being one parent.—Prized for fr. in Porto Rico and has been grown in Fla.

procerus. HIMALAYA-BERRY. Very vigorous and thorny, the woody per. canes 20–40 ft. long and trailing or clambering, young growths white-tomentose: lvs. thick, persistent, white-tomentose underneath; lfts. 3 or 5, broadly elliptic- ovate, sharply double-serrate: fls. white, in tomentose panicles: fr. a thimble-shaped blackberry, black, mid-summer to autumn. Eu.; now beginning to run wild.

procumbens: *R. flagellaris.*

pubescens (*R. triflorus*). Soft little unarmed plant, the sts. herbaceous or somewhat woody: lfts. 3 or 5, rhombic-ovate, acute, serrate, thin and nearly or quite glabrous: fls. white, to ½ in broad, 1–3 on the peduncle: fr. red-purple. Newf. to Alaska to N. J. and Neb., in swamps; sometimes colonized in moist places.

recurvans. Non-glandular medium highbush blackberry with more or less recurving prickly canes, distinguished from *R. frondosus* in its narrow and pointed or acuminate lfts. on the flowering shoots, and all lvs. being cut-toothed and often jagged. N. S. to Ia.—May be involved in the origin of some of the pomological blackberries.

reflexus. Creeping or scandent, sts., petioles and under side of lvs. rusty-tomentose: lvs. simple, triangular-ovate in outline, 3–5-lobed, middle lobe long, dark green above and hairy on veins: fls. about ⅓ in. across, white, in close clusters: fr. globose, dark purple. Hongkong.—Sometimes grown under glass and in warm countries.

robustus: *R. Fraseri*; another *R. robustus* is European and another Andean, probably neither in cult. here.

rosæfolius (*R. Commersonii*). More or less trailing, canes 5–8 ft. long, pubescent at least on younger parts, with few recurved prickles: lvs. pinnate, thinly hairy, sharply double-serrate; lfts. 5 or 7, lanceolate, long-acuminate, broad at base: fls. white, solitary or in small clusters, long-pedicelled, calyx-lobes long-caudate: fr. globose to oblong-thimble-shaped, red, edible. E. Asia; extensively nat. in American tropics and the fr. collected; often planted. Var. **coronarius,** see *R. coronarius.*

sativus: *R. allegheniensis.*

schmidelioides (*R. australis* var. *schmidelioides*). Scrambling or climbing, forming a dense diœcious bush with usually unarmed branchlets: lfts. 3 or 5, orbicular-ovate to ovate-lanceolate, mostly tomentose or pubescent underneath, petioles and midribs prickly: fls. whitish: fr. small, pale yellowish. New Zeal.; adapted to parts of Calif.

spectabilis. Salmonberry. Sts. per., upright, becoming long and prostrate, with few or weak spines, bark shredding, spreading by underground roots: lfts. 3, thin, ovate to oblong-ovate, acuminate, doubly dentate and somewhat lobed, nearly glabrous: fls. 1–4, rose-colored or purplish, about 1 in. across: fr. more or less conical, salmon-color, edible. Ida. and Calif. to Alaska.—Sometimes planted for ornament and hardy N.

strigosus: *R. idæus* var.

thyrsanthus: a European blackberry probably not cult. in this country; the name was once inaccurately applied to the Himalaya-berry (*R. procerus*).

thibetanus (*R. Veitchii*). Raspberry with pinnately compound lvs.: sts. erect, with slender prickles: lfts. 7–13, elliptic or ovate, coarsely toothed, white underneath, the terminal lft. larger and lobed or pinnatifid: fls. rose-purple: fr. nearly globose, blue-black. W. China.—Sometimes planted for ornament. A very different plant has been grown as *R. Veitchii.*

titanus. Enormous grower, to 40 ft., the canes vine-like and bearing many stiff prickles as also on the petioles and midribs: lfts. 3 or 5, ovate-attenuate, only thinly pubescent underneath, jagged-toothed and sometimes somewhat lobed: fls. white, bisexual, in short leafy clusters: fr. oblong, to 2½ in. long, black, sweet. Origin undetermined; the Mammoth blackberry, cult. in Calif. Var. **espinatus,** without prickles, is represented in the Cory (Cory Thornless).

triflorus: *R. pubescens.*

trivialis. Southern Dewberry. Variable long trailer, very prickly and commonly bristly-glandular, partially evergreen: lfts. 3 or 5, stiffish and glabrous, narrow-oblong to lanceolate, pointed, sharp-serrate: fls. white varying to pinkish, solitary or few: fr. oblong, black. Va. to Fla. and Tex.—Several named pomological forms have been intro.

ulmifolius. A name of doubtful application, in Eu., where native, a very thorny plant and probably not in cult. here, but known in the accepted var. **inermis** (*R. inermis*), the Evergreen Thornless Blackberry: canes per., very long and clambering, destitute of prickles: lfts. 3 or 5, thick, gray-pubescent underneath, oval to elliptic-ovate, serrate, acute: fls. mostly pinkish, in long panicles: fr. nearly globose, black. Grown somewhat in mild climates, particularly Calif. (often as Burbank's Thornless); for other thornless blackberries, see *R. canadensis.*

ursinus. Pacific Dewberry or Blackberry. At first erect or strongly ascending, becoming decumbent or vine-like, the canes bien., glaucous, at first soft-hairy and weakly prickly: lvs. simple or 3-foliolate, sharply double-serrate, gray-pubescent or tomentose underneath, petioles prickly: fls. imperfect, white, in close small clusters, pedicels and calyx prickly but glandless: fr. conical or oblong, black but running to reddish and whitish. Calif., Ore.—Pomological vars. have been reported.

Veitchii: *R. thibetanus.*

velox. Robust, glandless blackberry, canes arching or finally trailing to several ft., with hooked prickles: lfts. 3 or 5, ovate or elliptic-ovate, terminal one to 4 in. long, sharp-dentate, soft-pubescent underneath: fls. white, about 1 in. across, few in forking infl.: fr. 1 in. or more long, black, very early. Perhaps Tex.—Sorsby, Hogo, Spalding, McDonald blackberries.

villosus: see *R. allegheniensis.*

vitifolius: the plant grown under this name is usually *R. macropetalus*; perhaps sometimes *R. ursinus.*

xanthocarpus. Small plant with ann. shoots to 1 ft. tall, lightly hairy, prickles few and weak: lvs. 3-foliolate, terminal lft. ovate-oblong, all obtuse and serrate: fls. 1 or 2 in upper axils: fr. large, ovoid, bright yellow, edible. W. China.—Once intro. for its fr.

RUDBECKIA. Coneflower. *Compositæ.* N. American coarse summer-flowering herbs with simple or compound alternate lvs., and usually showy terminal heads of yellow ray-fls. and hemispheric to columnar disk greenish or yellowish to purplish-black; pappus a crown or teeth or none.

The coneflowers thrive in almost any soil and situation. Propagated by seeds, cuttings or divisions. They are useful for yellow border effects in summer and autumn; some of the annuals are adapted to the flower-garden.

amplexicaulis (*Dracopis amplexicaulis*). Ann. to 2 ft., glabrous, somewhat glaucous: lvs. oblong or ovate, entire or slightly toothed: heads solitary, 2 in. across, rays yellow often with a brown-purple base, disk brownish, becoming 1 in. high. Mo. to Tex.

bicolor. Ann. to 2 ft., bristly: lvs. lanceolate or oblong, to 2 in. long, entire: rays to 1 in. long, wholly yellow or with lower part dark colored, disk black, ¾ in. high. Ark. and Tex. to Ga. Var. **superba,** Erfurt C., has heads 2 in. across, rays yellow purplish-brown below.

californica. Per. to 5½ ft., pubescent: lvs. ovate or lanceolate, to 1 ft. or more long, entire or lower toothed or lobed: heads solitary, rays to 2 in. long, disk 1½ in. high. Calif., Ore.

columnaris (*Ratibida columnaris*). Per. to 2½ ft., pubescent: lvs. pinnate into linear entire or cut segms., to 4 in. long: heads sometimes double, rays 1 in. or more long, brown at base, disk gray, to 1½ in. long. Minn. to B. C. and Mex.

flava: *R. hirta.*

fulgida. Per. to 2 ft., hairy: lvs. oblong to lanceolate, to 4 in. long, mostly entire: heads 1½ in. across, rays golden-yellow or with orange base, disk black-purple, ½ in. across. Pa. to Fla. and Tex.

hirta (*R. flava*). Black-eyed Susan. Yellow Daisy. Bien. or sometimes ann., rough-hairy, to 3 ft.: lvs. oblong to lanceolate, to 5 in. long, mostly toothed: rays golden-yellow or sometimes deeper at base, to 2 in. long, disk purple-brown, ¾ in. across. Ont. to Fla. and Tex.

laciniata. Per. to 12 ft.: lvs. pinnately divided into toothed or lobed segms.: heads 4 in. across, rays yellow, drooping, disk greenish-yellow. Que. to Fla. and Ariz. Var. **hortensia,** Golden-Glow, fls. double.

Mandaiana: hort. name for a pure yellow form.

maxima. Per. to 9 ft., glabrous and glaucous: lvs. ovate, to 1 ft. long, nearly entire, clasping: rays yellow, to 2 in. long, drooping, disk brownish, to 2 in. long. Mo. to Tex.

montana. Per. to 6 ft., glabrous: lvs. pinnately divided, the upper entire: heads of purplish-black disk-fls. to 2½ in. long. Mts., Colo.

moschata: an old name of doubtful application.

Newmani: *R. speciosa.*

nitida. Per. to 4 ft.: lvs. ovate to lanceolate, to 6 in. long, entire or finely toothed: rays pure yellow, drooping, disk to 2 in. high. Ga. to Fla. and Tex.

pallida: *Echinacea pallida.*

purpurea: *Echinacea purpurea.*

speciosa (*R. Newmani*). Per. to 3 ft.: lvs. lanceolate to ovate, to 6 in. long, toothed: rays yellow often orange at base, 1½ in. long, disk brown-purple, to ¾ in. high. Pa. to Mich. and Ark.

subtomentosa. Sweet C. Per. to 6 ft., gray-pubescent, rough: lvs. toothed, ovate or 3-lobed, to 5 in. long: rays to 1½ in. long, yellow with sometimes dark base, disk dull brownish, ½ in. across. Ill. to Tex.

triloba. Brown-eyed Susan. Bien. blooming the first year, to 5 ft.: lower lvs. 3-lobed or -parted, rough: rays to 1 in. long, deep yellow or with orange or brown-purple base, disk black-purple, ½ in. across. N. J. to Ga. and La.

RUE: *Ruta.* **-Anemone:** *Anemonella thalictroides.* **Meadow:** *Thalictrum.*

RUELLIA. *Acanthaceæ.* Widely distributed herbs and shrubs with opposite entire lvs. and funnelform or salverform 5-lobed fls.; grown under glass and out-of-doors in the S. for the ornamental fls. Propagated by cuttings, seeds and division.

amœna (*Stephanophysum longifolia*). To 2 ft.: lvs. ovate to oblong-lanceolate, to 5 in. long, toothed or wavy: fls. bright red, 1 in. long, gibbous at base, long-stalked, in clusters. S. Amer.—Frequent in cult.

ciliosa. To 2½ ft.: lvs. oblong to ovate, to 3 in. long, ciliate: fls. blue, 2 in. long, sessile, solitary or in clusters. N. J. to Fla. and Tex.

Devosiana. To 1½ ft.: lvs. oval, to 2 in. long, entire, purple beneath, veined with white above: fls. white marked with lilac, 1¾ in. long, solitary. Brazil.—Makes a good decumbent greenhouse plant; has been grown as a Pellonia.

floribunda: plant cult. under this name is probably *R. amœna.*

formosa. Subshrub: lvs. ovate, to 3 in. long: fls. scarlet, 1½ in. long, long-stalked. Brazil.

longifolia: *R. amœna.*

macrantha. To 6 ft.: lvs. ovate-lanceolate, to 6 in. long: fls. rosy-purple, 3 in. or more long, solitary. Brazil.

Makoyana. Similar to *R. Devosiana* but fls. bright carmine and larger. Brazil.

malacosperma. To 3 ft.: lvs. lanceolate, to 6 in. long: fls. blue-purple, 1½ in. long. Cult. in Mex. and Cent. Amer.—Has been confused with *Strobilanthes isophyllus.*

nudiflora. To 1 ft. or more: lvs. oval, to 2 in. long: fls. violet, 1¾ in. long. S. U. S., Mex.

occidentalis: a listed name.

pedunculata. To 2 ft. or more: lvs. ovate-oblong, to 3 in. long: fls. lilac or bluish, on slender peduncles with 2 leaf-like bracts at summit. Mo. and south.

RULAC: *Acer Negundo.*

RUMEX. Dock. Sorrel. *Polygonaceæ.* Herbs, mostly weeds but a few grown for greens, with basal or st.-lvs. and small green bisexual or unisexual fls. borne in panicles. Of easy cult. in any garden soil. Propagated by seeds which yield plants for cutting in one or two years. The old kitchen-garden species are *R. Acetosa, R. Patientia, R. scutatus*; *R. abyssinicus* has now been introduced for similar use.

abyssinicus. Spinach-Rhubarb. Per. to 9 ft.: lvs. broadly ovate to arrow-shaped or lanceolate, to 7 in. long, entire or somewhat 3-lobed: fls. unisexual. Abyssinia.—The lvs. are eaten as spinach and the stalks as rhubarb.

Acetosa. Garden S. Per. to 3 ft.: lvs. oblong or oblong-oval, to 5 in. long, arrow-shaped at base: fls. unisexual. Eu., Asia; nat. in N. Amer.—One of the principal cult. forms is Large Belleville.

alpinus. Per. to 3½ ft.: lower lvs. ovate-cordate, very large: panicles showy. Mts. of Eu.

aquaticus. Per. to 6 ft.: lower lvs. ovate-cordate: fls. bisexual. Ponds Eu., N. Asia.

conglomeratus. Per. to 3 ft.: lvs. ovate to lanceolate, to 5 in. long: fls. bisexual, in leafy racemes. Eu.; nat. in N. Amer.

Hydrolapathum. Great Water-Dock. Per. to 6 ft.: lvs. oblong-lanceolate, to 2 ft. long, wavy-margined: fls. bisexual, in very large panicles. Eu.—Planted along ponds and streams.

hymenosepalus. Canaigre. Per. to 3 ft.: lvs. oblong to oblong-lanceolate, to 1 ft. long: fls. bisexual, the panicles to 1 ft. long. Okla. to Calif.—Tannin is produced from the tubers.

obtusifolius. Bitter D. Per. to 4 ft.: lvs. oblong-lanceolate, to 14 in. long, rounded or cordate at base: fls. bisexual. Eu.; nat. in N. Amer.

occidentalis. Per. to 3 ft.: lvs. lanceolate or ovate-lanceolate, to 1 ft. long: fls. bisexual. N. Amer.

Patientia. Spinach-Dock. Herb-Patience. Per. to 6 ft.: lvs. elliptic-ovate to lanceolate, to 1 ft. long: fls. bisexual, the panicles to 2 ft. long. Eu.; nat. in N. Amer.

pulcher. Per. to 3 ft.: lvs. oblong or fiddle-shaped, cordate, to 6 in. long: fls. bisexual. Eu.; nat. in N. Amer.

roseus (*R. vesicarius* var. *roseus*). Ann. to 2 ft.: lvs. triangular-ovate, small: fls. unisexual, in short racemes, the valves veined with rose. Egypt to Persia.

scutatus. French S. Low per., the sts. prostrate or ascending: lvs. cordate-ovate, those on the st. arrow- or fiddle-shaped: fls. unisexual. Eu. Asia.

RUNNER: a slender trailing shoot taking root at the nodes.

RUPTURE-WORT: *Herniaria.*

RUSCUS. *Liliaceæ.* Shrubs with minute bract-like lvs., the apparent lvs. being leaf-like branchlets or cladodes, small greenish unisexual fls. attached on the midrib of the cladodes, solitary or clustered, and berry-like frs.; grown out-of-doors in S. U. S. and the dried artificially colored sprays of *R. aculeatus* frequently used in florists' decorations.

aculeatus. Butchers Broom. To 3 ft., evergreen: lvs. or cladodes to 1½ in. long and 1 in. wide, spiny-pointed: berries red or yellow, to ½ in. across. Eu.

hypoglossum..To 1½ ft.: lvs. to 4 in. long and 1½ in. wide: berries red, ⅖ in. across. S. Eu.

hypophyllum. To 1 ft.: lvs. to 3 in. long and 1½ in. wide: berries red, ⅓ in. across. Canary Isls. to Caucasus.

racemosus: *Danaë racemosa.*

RUSH: *Juncus.* **Flowering-:** *Butomus umbellatus.*

RUSSELIA. Coral-Blow. *Scrophulariaceæ.* Trop. American shrubs with opposite or whorled lvs. often reduced to scales on the branches and red 2-lipped tubular fls.

Russelias are often grown in greenhouses and in the open far South, also good as basket-plants as the bloom is nearly continuous. Of easy culture. Propagated by cuttings.

elegantissima. Supposed hybrid between *R. equisetiformis* and *R. sarmentosa.*

equisetiformis (*R. juncea. R. scoparia*). Coral-Plant. Fountain-Plant. To 4 ft., much branched, branches rush-like, nodding or drooping, sts. sharply 4-angled: lvs. mostly reduced to bracts on the branches, but lanceolate to ovate and dentate when produced: fls. in 1–3-fld. clusters. Mex.; nat. in Fla. and W. Indies.

juncea: *R. equisetiformis.*

Lemoinei. Reputed hybrid between *R. equisetiformis* and *R. sarmentosa.*

multiflora: *R. sarmentosa.*

sarmentosa (*R. multiflora*). Similar to *R. equisetiformis* but with ovate toothed lvs. to 2 in. long, never reduced to scales, and fls. in many-fld. clusters. Mex.

scoparia: *R. equisetiformis.*

RUTA. Rue. *Rutaceæ.* Per. very aromatic or pungent herbs and subshrubs from the Medit. region eastward, with alternate simple or compound lvs., small yellow or greenish fls. in terminal clusters, and capsular fr.; grown for the medicinal properties and for general interest in herb gardens; hardy. Propagated by division and seeds.

chalepensis. Differs from *R. graveolens* in the fringed petals and the carpels of the fr. pointed. Medit. region.

graveolens (*R. officinalis*). Common R. Evergreen subshrub to 3 ft.: lvs. 2–3-pinnate: fls. yellowish, about ½ in. across: carpels of fr. obtuse. S. Eu.—An old inhabitant of herb gardens: lvs. sometimes variegated.

officinalis: *R. graveolens.*

patavina. Herb to 6 in.: lvs. simple, the lower ones oblong-spatulate, the upper lvs. 3-parted: fls. golden-yellow. S. Eu.—The plant grown under this name is sometimes *R. graveolens.*

RUTABAGA (*Brassica Napobrassica*). A hardier plant than the turnip (which see) and requiring a longer season of growth. The tuber has a long leafy neck, and the foliage is glaucous blue-green, smooth, very different from that of the turnip. Tubers left in the ground may survive the winter and go to seed the following year, becoming more or less spontaneous.

Seeds of rutabagas are sown in the northern parts of the country in June or very early July, usually in drills about 18 inches apart; 1 to 2 pounds of seed are required to the acre. Bagas are not grown as an early summer vegetable.

RUTACEÆ. Rue Family. Trees and shrubs of more than 100 genera widely distributed in warm regions, with simple or compound lvs. (sometimes reduced to a single lft.), bisexual, polygamous or diœcious fls. with 3–5 sepals and petals, the same or twice the number of stamens, and fr. of various forms, often pulpy and edible. The family is commonly known in cult. by the citrus fruits; most of the genera yield essential oils and many have medicinal properties. The genera here treated are Acronychia, Ægle, Æglopsis, Agathosma, Atalantia, Balsamocitrus, Barosma, Boronia, Calodendrum, Casimiroa, Chætospermum, Chalcas or Murræa, Choisya, Citropsis, Citrus, Clausena, Cneoridium, Coleonema, Correa, Dictamnus, Diosma, Eremocitrus, Eriostemon, Evodia, Feronia, Feroniella, Fortunella, Glycosmis, Hesperethusa, Lavanga, Microcitrus, Murræa, Orixa, Paramignya, Phebalium, Phellodendron, Poncirus, Ptelea, Ruta, Severinia, Skimmia, Triphasia, Vepris, Zanthoxyium.

RUTLAND BEAUTY: *Convolvulus sepium.*

RYE: *Secale cereale.* **Wild:** *Elymus.*

S

SABAL (*Inodes*). PALMETTO. *Palmaceæ*. About 20 species of acaulescent (caudex nearly or quite subterranean) or arboreous unarmed hermaphrodite fan-palms of the western hemisphere, ranging from warm-temp. to trop. conditions: spadix among the lvs., compound and often elongated, usually declined or drooping: fls. white or greenish, with 3 sepals and 3 petals; stamens 6: fr. a small globose or pyriform or globose-reniform, dark drupe with thin flesh, mostly 1-seeded. *S. minor* is a true fan-palm, the petiole ending at the blade; the others here described continue the petiole through the lf. as a midrib or rachis, giving the blade a peculiar curve and twist. For cult. see *Palm*.

acaulis: *S. minor*.

Adansonii: *S. minor*.

Blackburnia (commonly spelled *Blackburniana*. *S. Mocini*). BERMUDA P. Stout tree to 35 ft., the trunk shedding the lf.-bases: lvs. large and thick, the blades 5–9 ft. across, glabrous at maturity, light green on both sides, tessellate underneath, cleft half and more its depth by divisions 1–2 in. broad, with very few fibrils (usually 1 at each cleft), the points of divisions not narrow and limp: spadix large and much branched: fr. globose or obovoid, black, about ½ in. across. Bermuda.—Planted in many parts of the world, but not all the plants so named are correctly determined.

Deeringiana. Much like *S. minor* but with an evident erect trunk to 6 ft. S. La.

Etonia (*S. megacarpa*). Apparently acaulescent, the caudex crooked or S-shaped and not rising above ground: lvs. with continuing midrib, standing upright and rather stiff, deep green, very filiferous, the blade 3 ft. long; segms. about 40, extending to more than half depth of blade, deeply divided into long narrow points: fr. ½–¾ in. diam., black or nearly so. Dry lands, peninsular Fla.

exul. VICTORIA P. Large hardy tree with vivid green foliage, the lf.-bases on the trunk also green: main lf.-segms. about 2 in. broad and 3 ft. long: terminal branchlets of the spadix thickened: fr. solitary from each fl., nearly globular, about ¾ in. diam. Planted in Victoria, Tex., and elsewhere in that region; probably Mexican.

Ghiesbrechtii: a name without good botanical standing; some plants grown under this name are probably *S. Palmetto*, but others are different.

glabra: *S. minor*.

glaucescens: an undefined name perpetuated from old lists; different palms are grown under this designation.

havanensis: see *S. minor*.

Jamesiana. To 15 ft., smaller than *S. Palmetto* and shyer bloomer: lf.-blade flat and not folded upwards; segms. narrow and long-drooping; petiole long and slender: fls. smaller than in *S. Palmetto*. Hammocks, S. Fla.

longipedunculata: a label or listed name; probably *S. Palmetto*.

mauritiæformis: a confused name, probably not to be employed for plants in the trade in U. S.

megacarpa: *S. Etonia*.

mexicana. Probably the true *S. mexicana*, described as a slender short-stemmed tree from S. Mex. is not in cult. in this country; the name was formerly applied also to the tree now separated as *S. texana*.

minor (*S. acaulis. S. Adansonii. S. glabra. S. pumila*). DWARF P. Stemless palm, the caudex not rising above ground: lvs. glaucous or pale green, not filiferous, firm to stiff, middle segms. extending about half depth of blade and others much farther: spadix equalling or exceeding the lvs., with many short branches: fr. globose, about ⅓ in. diam. Ga. to Fla. and Tex., luxuriant when growing in swamps.—Plants grown as *S. havanensis* belong here.

Mocini: *S. Blackburnia*.

neglecta. Lvs. very large, the blade to 5 ft. long, deeply parted; segms. to 4 ft. long and 1½ in. broad at base, long-acuminate and deeply bifid: spadix very large: fr. small, somewhat tuberculate. Santo Domingo; reported as planted in Fla.

Palmetto. PALMETTO. CABBAGE P. Tree to 50 or even 90 ft., trunk with remains of lf.-bases or becoming bare, bearing a relatively small globular rather dense head of green foliage: lvs. 5–8 ft. long and often broader, conspicuously filamentose, middle segms. extending more than half way to the continuing midrib and others still deeper, the points very long and narrow and decurved or hanging: spadix long and much branched, usually exceeding the lvs. in old trees: fr. nearly globose, black, ⅓–½ in. diam., 1-seeded. N. C. to Fla., near the coast except in Fla.

princeps: a hort. name of uncertain meaning, and apparently applied to different kinds of Sabal. Described as much like *S. Blackburnia* but with smaller fr.

pumila: *S. minor*.

serrulata: *Serenoa repens*.

texana. TEXAS P. To 50 ft., the trunk eventually shedding most of the lf.-bases, the crown globular in old trees: lvs. yellowish-green, 5–6 ft. long and as broad or broader, moderately filamentose, cut half or more to the continuing midrib into very long-pointed segms.: spadix much branched, equalling or exceeding the lvs.: fr. larger than in *S. Palmetto*, globular to nearly reniform and in the latter case perhaps ¾ in. across, sometimes 2- or 3-seeded. Tex. in the lower Rio Grande valley and in Mex.

umbraculifera: a dubious name, meaning perhaps *S. Palmetto*, *S. Blackburnia*, or possibly other species.

uresana. To 30 ft. or more: lvs. glabrous and very glaucous, 3 ft. or more long, with many segms.: fr. flattened-globose, ¾ in. or less diam., green, edible. Sonora, Mex.

SABIACEÆ. SABIA FAMILY. Four genera of trees, shrubs or vines in trop. and warm-temp. Asia and Amer., with alternate simple or pinnate lvs., not showy bisexual or polygamous fls. having mostly 5 sepals, petals and stamens, superior 2-celled ovary, and indehiscent fr. Meliosma is sometimes planted for ornament outside botanic gardens.

SABINA: *Juniperus*.

SACALINE: *Polygonum sachalinense*.

SACCHARUM. *Gramineæ*. Very tall stout per. grasses with broad lvs. and spikelets in large terminal fluffy silky panicles; native in tropics of Old World and one widely cult. for cane-sugar. See *Grasses*.

ciliare. To 12 ft.: lvs. to 3 ft. and ½ in. broad: panicles to 1½ ft. long, linear-oblong, dense. S. W. Asia.

officinarum. SUGAR-CANE. To 15 ft., with solid canes: lvs. to 3 ft. long and 2 in. wide, with broad midrib and rough edges: panicles to 2 ft. long, plume-like with open and drooping branches, the spikelets with tufts of white hairs. Probably a cultigen.—Probably does not bloom in the continental U. S. Propagated by pieces of the st., but seeds are sometimes produced in tropics with which breeding experiments are conducted.

SACCOLABIUM BELLINUM: *Gastrochilus bellinus.* **Blumei**: *Rhynchostylis retusa.* **giganteum**: *Anota densiflora.* **miniatum**: *Ascocentrum miniatum.* **violaceum**: *Anota violacea.*

SADLERIA. *Polypodiaceæ.* Hawaiian low tree-ferns with tufted 2-pinnate lvs. and linear sori in rows each side of midrib. Sometimes grown under glass. See *Ferns.*

cyatheoides. Trunk 5 ft. or more high: lvs. leathery, dark green, to 3 ft. long, on stalks to 2 ft. long, segms. linear, to ½ in. long, with revolute margins.

SAFFLOWER: *Carthamus tinctorius.*

SAFFRON, FALSE: *Carthamus tinctorius.*

SAGE: *Salvia, Audibertia.* **Bethlehem-**: *Pulmonaria saccharata.* **-Brush**: *Artemisia tridentata* and *arbuscula.* **Jerusalem-**: *Phlomis fruticosa.*

SAGERETIA. *Rhamnaceæ.* Shrubs of Asia and warmer parts of N. Amer., with opposite lvs., small whitish bisexual fls. in clusters or spikes, and fr. a berry-like drupe; one species sometimes planted in S. U. S. Propagated by seeds and cuttings.

Michauxii: *S. minutiflora.*

minutiflora (*S. Michauxii*). Trailing or straggling, spiny: lvs. ovate, to 2 in. long, finely toothed, leathery, shining above: fls. in slender spikes to 1½ in. long: fr. purple, ⅓ in. across. N. C. to Fla. and Ala.

SAGINA. Pearlwort. *Caryophyllaceæ.* Ann. and per. tufted herbs, sometimes used for edgings or in the rock-garden, having awl-shaped lvs. and very small fls.; natives of temp. and colder regions. Propagated mostly by division.

glabra. Creeping per., often rooting at nodes, sts. to 4 in. long: lvs. linear: fls. white, July–Aug. S. Alps.

Linnæi: *S. saginoides.*

pilifera: *S. subulata.*

procumbens. Matted and spreading, to 3 in. high: lvs. linear, to ¼ in. long: fls. white, solitary, star-like, May–Aug. Asia; nat. in N. and S. Amer.

saginoides (*S. Linnæi*). Tufted per. to 4 in. high: lvs. linear or filiform, about ½ in. long: fls. white. Alpine and arctic Eu., Asia, N. Amer.

subulata (*S. pilifera. Spergula pilifera*). Hardy per., evergreen, densely tufted, covering the ground like a sheet of moss: lvs. very small, stiff: fls. white, on long slender sts., covering the plant, July–Sept. Corsica.

SAGITTARIA. Arrowhead. *Alismaceæ.* Aquatic per. herbs with tuberous or knotted rootstocks, arrow-shaped, lanceolate or ovate lvs. and fls. unisexual, both kinds usually on the same plant, in whorls of 3 in racemes or panicles and having 3 white deciduous petals; native in temp. and trop. regions. Arrowheads are grown in ponds and aquaria. Propagated by division, seeds, and underground tubers when produced.

Engelmanniana. To 1½ ft.: lvs. to 8 in. long and ½ in. wide, basal lobes one-third or more length of blade: fls. to 1 in. across. Mass., Conn., R. I.

graminea. To 2 ft.: lvs. linear to elliptic: fls. to ½ in. across. Newf. to S. D. and Tex.—The plants in the trade as *S. sinensis* and *sinensis gigantea* apparently belong here.

japonica: *S. sagittifolia* var. *flore-pleno.*

lancifolia. To 6 ft.: lvs. lanceolate to elliptic: fls. to 2 in. across. Fla. to Mex., trop. Amer.

latifolia (*S. variabilis*). To 4 ft.: lvs. variable, from linear-lanceolate to broad arrow-shaped with lobes half as long as blades: fls. to 1½ in. across. N. Amer.

montevidensis. Giant A. To 6 ft.: lvs. arrow-shaped, with lobes as long as blade: fls. 2 in. and more across, with brownish-purple spot at base of petals. S. Amer.; nat. in S. U. S.

natans. Floating or sometimes erect to 1 ft.: lvs. linear to oblong-ovate. N. Eu., Siberia.—It is not certain that plants cult. under this name belong here.

sagittifolia. Old-World A. To 4 ft.: lvs. variable, linear or arrow-shaped with lobes longer or shorter than blade: fls. about 1 in. across, spotted with purple at base of petals. Eu., Asia.—Produces underground tubers which are eaten in the Orient. Var. **flore-pleno** (*S. japonica*) has double fls.

sinensis: see *S. graminea.*

variabilis: *S. latifolia.*

SAGITTATE: like an arrowhead in form; triangular with the basal lobes pointing downward: see *hastate.*

SAINFOIN: *Onobrychis viciæfolia.*

ST. ANDREWS-CROSS: *Ascyrum hypericoides.* **Johns-Bread**: *Ceratonia Siliqua.* **Johns-Wort**: *Hypericum.* **Thomas-Tree**: *Bauhinia tomentosa.*

SAINTFOIN: *Onobrychis viciæfolia.*

SAINTPAULIA. *Gesneriaceæ.* Trop. African hairy perennials with basal long-stalked lvs., 2-lipped violet fls. in few-fld. cymes, the corolla-tube short, and capsular frs.; grown under glass and sometimes in window-boxes in warm countries. Propagated by seeds and by leaf-cuttings inserted in sand.

ionantha. African- and Usambara-Violet. Lvs. round or oblong-ovate, to 1½ in. long, toothed: fls. 1 in. across, with linear calyx-lobes: caps. narrow-oblong. Var. **grandiflora** has larger deep violet fls. Var. **variegata** has lvs. variegated with yellow and white.

kewensis. Similar to *S. ionantha* but with entire white-hairy lvs., oblong-linear calyx-lobes and much broader hairier caps.

SALAL: *Gaultheria Shallon.*

SALICACEÆ. Willow Family. Two genera of diœcious trees and shrubs mostly native in temp. regions of the northern hemisphere, having alternate simple lvs., the unisexual fls. without perianth borne in more or less silky-hairy catkins, 1 or many stamens, 1-celled ovary, and small capsular frs. Populus and Salix are planted for ornament and service. The systematology of the species is mostly difficult, and hybrids are many.

SALICORNIA. Glasswort. *Chenopodiaceæ.* Fleshy herbs native in salt marshes of Eu., Asia and N. Amer., of little hort. interest but sometimes listed: lvs. reduced to scales at the nodes and bearing the fls. in their axils, the stamens exserted.

europæa (*S. herbacea*). Ann. to 2 ft., turning bright red in autumn: spikes to 3 in. long in fr. Eu., Asia, N. Amer.

herbacea: *S. europæa.*

SALISBURIA ADIANTIFOLIA: *Ginkgo biloba.*

SALIX. Willow. Osier. *Salicaceæ.* Woody diœcious plants with mostly lanceolate lvs. and little fls. borne in dense catkins before or after the lvs.; grown for ornament, screens, shelter, holding of banks, and some of the species for the twigs from which baskets are made; mostly lowland plants.

Willows are well adapted to moist situations and along stream banks, but most of them succeed also in almost any soil. A few species are dry-soil plants. They grow rapidly. Propagated by ripe-wood cuttings taken in the fall and planted at once or kept in the cellar until spring: also by seeds sown in pans on moss as soon as the capsules are ripe. Weeping or special varieties may be top-grafted on upright stock. They are soft-wooded plants.

acuminata: *S. dasyclados.*

acutifolia. Similar to *S. daphnoides* but smaller, with narrower lvs. and slenderer catkins. Russia to E. Asia.

alba. White W. To 75 ft.: lvs. lanceolate, to 4 in. long, finely toothed, with white silky hairs beneath: catkins with the lvs. Eu., Asia. N. Afr.; escaped in N. Amer. Var. **calva** (*S. cærulea*) has more upright branches. Var. **chermesina** (*S. vitellina* var. *britzensis*), branchlets bright red. Var. **sericea** (var. *regalis*), lvs. densely silky beneath. Var. **tristis** (var. *vitellina pendula*), branches bright yellow and drooping. Var. **vitellina** (*S. vitellina*), branchlets yellow, lvs. glaucous beneath.

ambigua. Puzzle W. Hybrid between *S. aurita* and *S. repens*, low shrub with rather small silky-tomentose lvs.

americana pendula: *S. purpurea* var.

amygdalina (*S. triandra*). Almond-leaved W. To 30 ft.: lvs. lanceolate or ovate-lanceolate, to 4 in. long, finely toothed, glossy dark green above, paler below: catkins with the lvs. Eu., Asia. Var. **glaucophylla** (var. *discolor*) has lvs. grayish or whitish beneath.

amygdaloides. Peach-leaved W. Differs from *S. amygdalina* chiefly in the slender glandless petioles and cuspidate-acuminate lvs. N. Amer.

annularis: *S. babylonica* var. *crispa.*

aurita. Shrub to 6 ft.: lvs. obovate or oblanceolate, to 3 in. long, obscurely toothed, gray-tomentose beneath but becoming glabrous: catkins before or with the lvs. Eu., W. Asia.

babylonica. Weeping W. To 30 ft., with long drooping branches: lvs. narrow-lanceolate, to 6 in. long, finely toothed, grayish-green beneath: catkins with the lvs. China. Var. **crispa** (*S. annularis*) has curled ring-like lvs.

blanda (*S. Petzoldii* var. *pendula. S. babylonica* var. *dolorosa*). Wisconsin Weeping W. Hybrid probably between *S. babylonica* and *S. fragilis*, with long drooping branches.

Bockii. Shrub to 9 ft.: lvs. oblong or obovate, to ½ in. long, entire or slightly toothed, deep green above, bluish-white and silky beneath: catkins with lvs. in autumn. China.

brachycarpa. Shrub to 3 ft.: lvs. elliptic-oblong to oblanceolate, to 1 in. long, entire, hairy on both sides: catkins with the lvs. B. C. to Colo.

cærulea: *S. alba* var. *calva.*

Caprea. Goat W. Sallow. To 25 ft.: lvs. broad-ovate to oblong, to 4 in. long, slightly toothed or entire, gray-pubescent beneath: catkins before the lvs. Eu., Asia. Var. **pendula,** Kilmarnock W., has crooked drooping branches; to be worked on other stocks. Var. **variegata** has lvs. variegated with white.

cinerea. Gray W. Shrub to 15 ft.: lvs. elliptic to obovate-lanceolate, to 3½ in. long, wavy-margined, gray-pubescent beneath: catkins before or with the lvs. Eu., Asia. Var. **tricolor** has lvs. variegated with yellow and white.

daphnoides. To 30 ft.: lvs. oblong- to narrow-lanceolate, to 4 in. long, finely toothed or nearly entire, glaucous beneath: catkins before or with the lvs. Eu., Asia.

dasyclados (*S. acuminata* of some). To 18 ft.: lvs. lanceolate, to 8 in. long, gray-pubescent beneath: catkins before the lvs. Eu.

discolor. Pussy W. To 20 ft.: lvs. oblong, to 4 in. long, wavy-toothed or nearly entire, glaucous beneath: catkins before the lvs. N. S. to Va. and Mo.

Doniana. Hybrid between *S. purpurea* and *S. repens*, with oblong or lanceolate lvs. glaucous beneath.

elegantissima (*S. Sieboldii*). Thurlow Weeping W. Branches long and drooping: lvs. lanceolate, to 6 in. long, finely toothed, bluish-green beneath: catkins with the lvs. Japan?

Forbyana: *S. rubra.*

fragilis. Brittle or Crack W. To 60 ft.: lvs. lanceolate, to 7 in. long, toothed, light green beneath: catkins with the lvs. Eu., Asia; escaped in E. U. S. Var. **bullata** is a compact bushy form.

franciscana: *S. lasiolepis* var. *Bigelovii.*

glabra. Shrub to 4 ft.: lvs. broad-elliptic to oblong, to 3 in. long, wavy-toothed, glaucescent beneath: catkins with the lvs. Eu.

glaucophylloides. To 15 ft.: lvs. oval to oblong-lanceolate, to 5 in. long, finely toothed, glaucous beneath: catkins with the lvs. N. B. to Me. Var. **glaucophylla** has thicker lvs. Ont. to Wis.

glaucops. Shrub to 6 ft.: lvs. oblanceolate or obovate, to 2½ in. long, entire, pale beneath: catkins with the lvs. Alaska to Calif., New Mex., Utah.

gracilistyla. Shrub: lvs. oblong, to 4 in. long, finely toothed, grayish-pubescent beneath: catkins before the lvs. Japan, Korea.

grandifolia. Shrub to 10 ft.: lvs. oval to obovate, to 6 in. long, wavy-toothed, light green beneath: catkins before or with the lvs. Eu.

hastata. Halberd-leaved W. Shrub to 5 ft.: lvs. ovate to obovate, to 3 in. long, sometimes heart-shaped at base, finely toothed, glaucous beneath: catkins with the lvs. Eu., Asia.

Helix: probably *S. rubra.*

helvetica. Shrub to 2 ft.: lvs. oblong or elliptic-lanceolate, entire, white-tomentose beneath: catkins with the lvs. Alps.

humilis. Prairie W. Shrub to 8 ft.: lvs. oblong-lanceolate, to 4 in. long, slightly toothed, glaucous and tomentose beneath: catkins before the lvs. Newf. to Minn. and N. C.

incana. To 45 ft.: lvs. narrow-lanceolate, to 6 in. long, revolute at margins, white-tomentose beneath: catkins before the lvs. Eu., Asia Minor.

japonica. Shrub to 6 ft.: lvs. elliptic-oblong, to 5 in. long, sharply toothed, silky-pubescent becoming glabrous: catkins with the lvs. Japan.

Læstadiana. Hybrid between *S. lapponum* and *S. Caprea*, with lvs. silky-pubescent beneath.

lævigata. Red or Polished W. To 40 ft.: lvs. lanceolate, to 6 in. long, nearly entire, glaucous beneath: catkins with the lvs. Calif. to Ariz.

Lambertiana: *S. purpurea* var.

lapponum. Shrub to 5 ft., much branched: lvs. elliptic-oblong to lanceolate, to 2¼ in. long, entire, pubescent above, tomentose beneath: catkins before or with the lvs. Mts., Eu. to Siberia.

lasiandra. To 60 ft.: lvs. lanceolate, to 4 in. long, wavy-toothed, glaucous beneath: catkins with the lvs. B. C. to New Mex.

lasiolepis. Arroyo W. To 35 ft.: lvs. oblanceolate, to 4 in. long, nearly entire, glaucous beneath: catkins before the lvs. Wash. to Mex. Var. **Bigelovii** (*S. franciscana*) has lvs. pubescent below.

latifolia. Hybrid between *S. Caprea* and *S. myrsinifolia*, with elliptic to oblong lvs. silky-pubescent when young.

laurifolia: *S. pentandra.*

longifolia. Sandbar W. Shrub to 12 ft. or tree to 25 ft.: lvs. linear-lanceolate, to 4 in. long, slightly toothed: catkins with the lvs. N. Amer.

lucida. Shining W. To 18 ft.: lvs. ovate-lanceolate or lanceolate, to 5 in. long, finely toothed, shiny on both sides: catkins with the lvs. Newf. to Neb.

ludificans. Hybrid between *S. aurita* and *S. phylicifolia*, with elliptic glabrous lvs.

magnifica. To 18 ft.: lvs. elliptic, to 8 in. long, nearly entire, glaucous beneath: catkins with the lvs. China.

Matsudana. To 40 ft.: lvs. narrow-lanceolate, to 3 in. long, sharply toothed, whitish beneath: catkins with the lvs. N. Asia.

mollissima. Hybrid between *S. amygdalina* and *S. viminalis* with lvs. gray-tomentose beneath.

multinervis. Hybrid between *S. aurita* and *S. cinerea* with lvs. gray-pubescent beneath and small catkins.

myrsinifolia (*S. nigricans*). Shrub to 12 ft.: lvs. orbicular-ovate to oblong-lanceolate, to 4 in. long, toothed, gray-green and glabrous or pubescent beneath: catkins before or with the lvs. Eu., Asia.

myrsinites. Shrub to 1½ ft.: lvs. elliptic to lanceolate, to 2 in. long, toothed, shining green on both sides: catkins with the lvs. Eu. Asia.

myrtilloides. Shrub to 1½ ft.: lvs. elliptic, entire, light green beneath: catkins before or with the lvs. Eu., Asia.

nigra. BLACK W. To 35 ft.: lvs. lanceolate, to 5 in. long, finely toothed, pale green beneath: catkins with the lvs. N. Amer.

nigricans: *S. myrsinifolia.*

patula. Hybrid between *S. incana* and *S. aurita* with lvs. gray-pubescent beneath.

pentandra (*S. laurifolia*). BAY or LAUREL W. To 60 ft.: lvs. elliptic, to 5 in. long, finely toothed, shining dark green above, paler beneath: catkins with the lvs. Eu., escaped in E. U. S.

Petzoldii pendula: *S. blanda.*

phylicifolia. Shrub to 3 ft. or more: lvs. elliptic to lanceolate, to 3 in. long, toothed, grayish-green beneath: catkins before or with the lvs. Eu., Asia.

Pontederana (*S. sordida*). Hybrid between *S. purpurea* and *S. cinerea*, with lvs. silky and glaucous beneath.

purpurea. PURPLE O. Shrub to 9 ft.: lvs. oblanceolate, to 4 in. long, finely toothed, paler beneath: catkins before the lvs. Eu., N. Afr., Asia. Var. **Lambertiana** (*S. Lambertiana*) has purplish stouter branches. Var. **pendula** (*S. americana pendula*) has slender drooping branches. Var. **gracilis** (var. *uralensis*) has slender branches and narrow lvs.

regalis: *S. alba* var. *sericea.*

repens. CREEPING W. Shrub to 3 ft., the st. prostrate: lvs. elliptic to lanceolate, to 2 in. long, nearly entire, silky when young. Eu., Asia. Var. **nitida** (var. *argentea*) has lvs. densely silky when young.

Reuteri. Hybrid between *S. incana* and *S. daphnoides* with lvs. silky-tomentose beneath.

rosmarinifolia of the trade is *S. incana.*

rubens. Hybrid between *S. fragilis* and *S. alba*, with lvs. usually glaucous beneath.

rubra (*S. Forbyana. S. Helix*). Hybrid between *S. purpurea* and *S. viminalis*, shrub to 9 ft. with lanceolate lvs.

Salamonii: *S. sepulcralis.*

Scouleriana. To 30 ft.: lvs. oblong-obovate, to 4 in. long, nearly entire, silvery- or rusty-pubescent beneath but becoming glabrous. Alaska to Calif. and New Mex.

sepulcralis (*S. Salamonii*). Hybrid between *S. babylonica* and *S. alba*, with drooping branches and lvs. silky-pubescent beneath.

sericea. SILKY W. Shrub to 12 ft.: lvs. lanceolate, to 4 in. long, finely toothed, silky beneath: catkins before the lvs. Me. to Mich. and Va.

sesquitertia. Hybrid between *S. purpurea* × *aurita* and *S. phylicifolia*, shrub to 6 ft.

Sieboldii: *S. elegantissima.*

silesiaca. Shrub: lvs. lanceolate or ovate, to 6 in. long, toothed, pale green beneath. Eu.

Smithiana. Hybrid between *S. viminalis* and *S. Caprea*, shrub to 18 ft. with lvs. gray-pubescent beneath.

sordida: *S. Pontederana.*

stipularis. Large shrub: lvs. narrow-lanceolate, to 8 in. long, grayish-tomentose beneath. Eu.

tetrapla. Hybrid between *S. phylicifolia* and *S. myrsinifolia*, of intermediate character.

triandra: *S. amygdalina.*

tristis. Shrub to 1½ ft.: lvs. oblanceolate, to 2 in. long, entire, white-tomentose beneath: catkins before the lvs. Me. to Fla. and Tenn.

uralensis: *S. purpurea* var. *gracilis.*

uva-ursi. BEARBERRY W. Prostrate shrub: lvs. obovate, to 1 in. long, entire or slightly toothed, shining above, glaucous beneath: catkins with the lvs. Alaska to Lab., south to mts. of N. Y.

viminalis. COMMON O. To 30 ft.: lvs. lanceolate, to 10 in. long, entire, silvery-white and silky-tomentose beneath: catkins before the lvs. Eu., Asia: escaped in E. U. S.—The commonest species employed in basket-making.

vitellina: *S. alba* var.

Wentworthi: listed name.

Wilhelmsiana. Shrub: lvs. linear, to 1½ in. long, nearly entire, becoming glabrous: catkins with the lvs. Asia.

Wimmeriana. Hybrid between *S. purpurea* and *S. Caprea*, with lvs. grayish below.

SALLOW: *Salix Caprea.*

SALMONBERRY: *Rubus spectabilis.*

SALOA: *Blumenbachia.*

SALOMONIA: *Polygonatum.*

SALPICHROA. *Solanaceæ.* Shrubs, subshrubs and herbs, one form sometimes used as cover and fence planting S. and mentioned for bee forage; lvs. entire, long-petioled: fls. small, white or yellow, solitary, tubular or urn-shaped: fr. a berry. Propagated by cuttings of half-ripened wood and kept in a close atmosphere; also from seeds when obtainable.

rhomboidea. COCKS-EGGS. Per. climber from a fleshy root, somewhat woody, with a strong odor: lvs. ovate-rhomboid, to ¾ in. long: fls. nodding, white, urn-shaped, ⅓ in. long: berry yellow or white, said to be edible. Argentina.—Offered in the trade as *Withania origanifolia.*

SALPIGLOSSIS. *Solanaceæ.* Sticky-hairy herbs with alternate, entire, toothed or cut lvs., many colored usually large funnel-shaped fls. with wide throat, and capsular fr.; native in Chile.

Salpiglossis requires the usual treatment given half-hardy annuals but the young plants should not be allowed to become stunted before they are transplanted to the garden. When desired for winter bloom in the greenhouse, the seed should be sown in late summer.

grandiflora: *S. sinuata.*

hybrida: *S. sinuata.*

sinuata (*S. grandiflora. S. hybrida. S. variabilis*). PAINTED-TONGUE. Half-hardy branching ann. to 2½ ft.: lvs. elliptic- or oblong-linear, sinuate-toothed or cut: fls. to 2½ in. long and as wide, straw-colored, primrose, yellow through scarlet, nearly to blue, with much variation in veining and other markings. Var. **superbissima** is unbranched and of more columnar habit.

variabilis: *S. sinuata.*

SALSIFY: *Tragopogon porrifolius.* **Black:** *Scorzonera hispanica.*

SALSOLA. *Chenopodiaceæ.* Widely distributed weedy herbs with stiff prickly lvs. and bisexual axillary small fls.; rarely grown in gardens for interest but of slight ornamental value.

Kali. SALTWORT. Ann. to 2 ft.: lvs. to ¾ in. long, grayish: fls. solitary. Eu., Asia, seashores of E. N. Amer.—A related species is *S. pestifer*, the Russian thistle.

SALTBUSH: *Atriplex.*

SALT TREE: *Halimodendron.*

SALTWORT: *Salsola Kali.*

SALVERFORM, SALVER-SHAPED: with a slender tube and an abruptly expanded flat limb, as that of the phlox.

SALVIA. SAGE. *Labiatæ.* Herbs, subshrubs or shrubs, with tubular 2-lipped fls. in whorls of 2 or more arranged in spikes, racemes or panicles, the colors ranging widely from scarlet through purple and violet to azure-blue, white and even pale yellowish, but no pure yellow.

Some species are grown for ornament in the garden or conservatory, others for culinary or medicinal purposes. *S. splendens*, scarlet sage, is the most widely cultivated of the ornamental sages. It is treated as an annual. It should be grown in masses with a good background of green, preferably in full sun but it may be used to brighten shady places such as a woody recess; if well managed it will bloom continuously from July to frost. The other salvias require only simple treatment, as flower-garden and border subjects; and the sweet-herb species, *S. officinalis*, persists for years when once established.

apiana: *Audibertia polystachya.*

argentea. Silver S. Bien. to 4 ft.: lvs. broad-ovate, to 8 in. long, lobed, white-woolly: fls. rose-white, purplish, whitish or yellowish, ¾ in. long, in panicles. Medit. region.

aurea. Shrub 3 ft. or more, white-tomentose: lvs. ovate, to 1 in. long, entire, leathery: fls. golden-yellow, to 2 in. long, in racemes to 4 in. long. S. Afr.

azurea. Per. to 3 ft. or more, glabrous except perhaps above: lvs. oblong to linear: fls. blue or white, about ½ in. long, calyx puberulent, in mostly simple open not very long racemes. S. C. to Fla. and Tex.—The plants cult. under this name (var. *grandiflora*) are mostly or wholly the more western *S. Pitcheri.*

Baumgartenii: *S. pratensis* var.

Bertolonii. Per., erect or ascending: lvs. ovate-cordate, toothed or lobed, wrinkled, pubescent beneath: fls. red-purple or violet-blue, rarely white, in branched racemes. S. Eu.

bicolor. Spanish S. Bien. or per. to 3 ft.: lvs. broad-ovate, palmately lobed, sticky-pubescent: fls. bluish-violet and white, 1 in. long, in racemes to 2 ft. long. Spain, N. Afr.—See also *S. coccinea* var.

brachycalyx: *S. indica.*

bracteata. Subshrub to 1½ ft., pubescent: lvs. pinnately divided, the floral-lvs. entire and persistent, sometimes colored: fls. purplish, in racemes. Asia Minor.

brunellodes: *S. prunelloides.*

cacaliæfolia. Per. to 3 ft.: lvs. broad-triangular, pubescent: fls. deep blue, small, in branched racemes. Mex.

cadmica. Per. to 1 ft.: lvs. oblong or oval, to 1½ in. long, entire or lobed: fls. white, 1 in. long, in racemes. Asia Minor.

cærulea. Herb: lvs. ovate, to 4 in. long, pubescent above: fls. blue, 1½ in. or more long, in racemes to 6 in. long. Brazil.

cardinalis: *S. fulgens.*

carduacea. Thistle S. Ann. to 2 ft., thistle-like, tomentose: lvs. basal, oblong, lobed, spiny-toothed: fls. lavender or bluish-purple, 1 in. long, in many-fld. head-like whorls 1½ in. diam. subtended by spiny bracts, calyx woolly. Calif.

clandestina var. **angustifolia** (*S. cleistogama*). Per. to 2 ft.: lvs. oblong, to 4 in. long, pinnatifid: fls. blue, ⅓ in. long, in racemes to 1 ft. long. S. Afr.

cleistogama: *S. clandestina* var. *angustifolia.*

coccinea (*S. rosea*). Texas S. Ann. or per. to 2 ft., pubescent: lvs. ovate, to 2½ in. long, toothed: fls. scarlet, to 1 in. long, in racemes to 8 in. long. S. C. to Fla. and Tex., trop. Amer. Var. **bicolor** has upper lip white, lower lip carmine-red.—The name *coccinea* is sometimes misapplied to *S. splendens.*

colorans: *S. splendens.*

dichroa. Per. to 3 ft.: lvs. oblong-ovate, to 8 in. long, toothed, pubescent: fls. deep blue with white spot on lower lip, in racemes 1 ft. or more long. N. Afr.

farinacea. Mealycup S. Per. to 3 ft., pubescent: lvs. ovate-to linear-lanceolate, to 4 in. long, toothed: fls. violet-blue, ½ in. long, in racemes to 8 in. long, calyx white or violet-tomentose. Tex. Var. **alba** has white fls.

fulgens (*S. cardinalis*). Cardinal S. Mexican Red S. Shrub to 3 ft.: lvs. ovate, to 3 in. long, toothed, white-woolly beneath: fls. bright scarlet, 2 in. long, in racemes to 1 ft. long. Mex.

globosa. Roundtop S. Bien. to 3 ft.: lvs. in a flattened rosette, deeply cut, white-tomentose: fls. large, white. Asia Minor.

glutinosa. Per. to 3 ft., sticky-hairy: lvs. ovate-oblong, to 8 in. long, toothed: fls. pale yellow, 1½ in. long, in racemes. Eu., Asia.

Grahami. Shrub to 3 ft.: lvs. oval, to 1 in. long, nearly entire: fls. red, 1 in. long, in racemes 1 ft. or more long. Mex.

grandiflora. Shrub to 2 ft. or more, sts. white-woolly: lvs. ovate, to 2½ in. long, toothed: fls. blue, to 2 in. long, in racemes. Asia Minor.

Greggii. Autumn S. Shrub to 3 ft.: lvs. oblong, ½ in. long, entire: fls. red or purplish-red, 1 in. long, in racemes to 4 in. long, in autumn. Tex., Mex. Var. **alba** has white fls.

Heerii. Subshrub to 5 ft.: lvs. ovate to lanceolate, toothed, wrinkled, pubescent beneath: fls. scarlet, ¾ in. long, in racemes. Peru.

hispanica. Ann. to 2 ft.: lvs. ovate, to 3 in. long, toothed: fls. pale blue, in racemes to 4 in. long. S. Amer., Mex.

Horminum. Ann. to 1½ ft., pubescent: lvs. oblong to ovate, floral-lvs. often colored: fls. lilac to purple, ½ in. long, in racemes. Medit. region. Var. **violacea** has light violet-blue fls.

Hoveyi: *S. ianthina.*

ianthina (*S. Hoveyi*). Per. to 2 ft.: lvs. ovate, toothed, wrinkled, floral-lvs. colored: fls. purple-violet, large. Probably Mex. or Peru.

indica (*S. brachycalyx*). Coarse per. to 4 ft. with rough broad basal lvs. to 10 in. long: lvs. ovate to oval, sinuate-toothed, the uppermost sessile: fls. in separated whorls, ¾ in. or more long, upper lip blue-purple and strongly arching, lower spotted. Syria.

interrupta. Shrub to 4 ft.: lvs. pinnately divided, the terminal lfts. largest, to 6 in. long, wrinkled, white-tomentose beneath: fls. bluish-white, in racemes to 2 ft. long. N. Afr.

involucrata. Roseleaf S. Subshrub: lvs. ovate or oblong-ovate, to 5 in. long, toothed, floral-lvs. bract-like, colored: fls. rose, 1 in. or more long, calyx red or purplish, in dense racemes to 6 in. long. Mex., Cent. Amer.

japonica. Per. to 1½ ft.: lvs. ovate, to 4 in. long, pinnately divided into deeply toothed segms.: fls. dark lilac or blue, in racemes to 5 in. long. Japan.

lanceolata. Per. to 1½ ft.: lvs. oblong-lanceolate, to 3 in. long, slightly toothed: fls. purplish, ½ in. long, in racemes to 6 in. long. Neb. to Tex. and Mex.

leucantha. Mexican Bush S. Shrub to 2 ft.: lvs. linear-lanceolate, to 6 in. long, toothed, white-tomentose beneath: fls. white, ¾ in. long, the calyx lavender-tomentose, in racemes to 10 in. long. Mex.

leucophylla: *Audibertia nivea.*

mellifera: *Audibertia stachyoides.*

mexicana. Herb: lvs. ovate or oblong, to 3 in. long, toothed, pubescent: fls. blue, in racemes to 1 ft. long. Mex.—Name has been used for *S. splendens.*

Montbretii. Per. to 1½ ft.: lvs. oblong or lanceolate, to 5 in. long, white-tomentose beneath: fls. blue, 1 in. long, in racemes to 9 in. long. Asia Minor, Syria.

nemorosa (*S. virgata* var. *nemorosa*). Violet S. Hardy per. to 3 ft., much branched: lvs. lanceolate to oblong, to 4 in. long, toothed, wrinkled, pubescent beneath: fls. violet or purple, to ½ in. long, in racemes to 1 ft. long. Eu., W. Asia. Var. **alba** has white fls.

nilotica. Per.: lvs. ovate, entire, lower lvs. lyrate, to 6 in. long: fls. pale blue, in long raceme-like panicles. Trop. Afr.

nutans. Hardy per. to 3 ft.: lvs. ovate-oblong, to 5 in. long, toothed, pubescent beneath: fls. violet, ⅓ in. long, in racemes to 1½ in. long, nodding as the fls. open. S. E. Eu.

officinalis. Garden S. Hardy subshrub used for seasoning, usually white-woolly: lvs. oblong, 2 in. or more long, toothed or entire, wrinkled: fls. purple, blue or white, ¾ in. long, in racemes. Medit. region. Var. **albiflora** has white fls. and **rubriflora** red.

patens. Gentian S. Half-hardy per. to 2½ ft., sticky-hairy: lvs. ovate or arrow-shaped, toothed: fls. blue, 2 in. long. Mts. of Mex.

Pitcheri (*S. azurea* var. *grandiflora*). Per. to 4 ft., closely grayish-pubescent: lvs. linear or broadly so: fls. blue or white, to 1 in. long, calyx densely pubescent, spicate racemes long and rather dense. Minn. and Ill. to Kans. and Tex.—See *S. azurea.*

pratensis. Hardy per. to 3 ft., root sometimes tuberous: lvs. cordate-ovate, toothed, wrinkled, slightly spotted with blood-red: fls. bright blue, seldom red or white, 1 in. long, in racemes. Eu. Var. **alba** has white fls., **Baumgartenii**, violet fls., **rubicunda** rose-red, and **Tenorii**, deep blue.

prunelloides (*S. brunellodes*). Per. to 1½ ft.: lvs. ovate-oblong, toothed: fls. blue, in long-stalked racemes. Mex. Var. **purpurea**, fls. purplish-red.

pulchella. Herb or subshrub: lvs. broad-ovate, to 3 in. long, toothed: fls. red, 1 in. long, in long racemes. Mex.

ringens. Hardy shrub to 2 ft.: lvs. irregularly pinnately cut, pubescent: fls. reddish-purple or light blue, to 1½ in. long, in racemes. Greece.

rosea: *S. coccinea*.

rugosa. Herb: lvs. oblong or sometimes ovate, to 8 in. long, toothed, pubescent and rugose: fls. white or purple and white, ¾ in. long, in racemes to 1 ft. long. S. Afr.

rutilans. A plant with scarlet fls. to 1 in. long, of uncertain botanical standing; possibly a form of *S. splendens*.

Schiedeana. To 5 ft.: lvs. ovate, to 3 in. long, toothed, slightly pubescent: fls. blue, ⅓ in. long, in dense whorls in spikes to 5 in. long. Mex.

Sclarea. CLARY. Hardy bien. to 3 ft.: lvs. broad-ovate, to 9 in. long, hairy, toothed, floral-lvs. colored rose and white: fls. whitish-blue, to 1 in. long, in panicled racemes. S. Eu. Var. **turkestanica** has white fls. tinged pink.

Sessei. Shrub to 15 ft.: lvs. ovate, to 5 in. long, toothed: fls. scarlet, 2 in. long, in loose panicled racemes, the calyx red. Mex.

spathacea: *Audibertia grandiflora*.

splendens (*S. colorans*). SCARLET S. Shrub to 8 ft., but cult. as an ann.: lvs. ovate, to 3½ in. long, toothed, glabrous, floral-lvs. and bracts colored: fls. scarlet, 1½ in. long, in racemes, the calyx scarlet. Brazil. Var. **alba** has white fls. Var. **compacta**, of smaller compact habit.

sylvestris. Hardy per. to 3 ft.: lvs. oblong-lanceolate, to 4 in. long, toothed, pubescent beneath, floral-lvs. colored: fls. purple-violet, small, in long slender racemes. Eu. and Asia. Var. **alba** (var. *flore-albo*) has white fls.

tiliæfolia. Herb: lvs. broad-ovate, to 1½ in. long, toothed: fls. blue, very small, in dense racemes to 3 in. long. Mex.

triangularis. Per. to 1½ ft.: lvs. ovate, to 1¼ in. long, toothed, pubescent: fls. blue, ½ in. long, in racemes to 8 in. long. S. Afr.

tubifera. Herb or subshrub to 3 ft. and more: lvs. broad-ovate, toothed, nearly glabrous or white-pubescent beneath: fls. purplish-red, to 1¼ in. long, in racemes to 6 in. long. Mex.

turkestanica: *S. Sclarea* var.

uliginosa. BOG S. Per. to 6 ft.: lvs. oblong-lanceolate, to 4 in. long, toothed: fls. blue or white, ¾ in. long, in racemes. Brazil, Argentina, Uruguay.

verbascifolia. Per. to 1 ft.: lvs. broad-ovate, lobed, thick and wrinkled, white-tomentose below: fls. white with blue hairs, to ¾ in. long, in panicles. Caucasus.

verbenaca. VERVAIN S. Hardy per. to 2 ft.: lvs. oblong or ovate, lobed, to 4 in. long: fls. blue, rarely white, to ½ in. long, in long racemes. Eu. and Orient.

verticillata. LILAC S. Per. to 3 ft., pubescent: lvs. broad-ovate, cordate or lyrate-pinnatifid, to 3 in. long: fls. lilac-blue, ⅓ in. long, in dense remote whorls. Eu., Asia Minor, Caucasus.

virgata. Per. to 6 ft., pubescent: lvs. broad-ovate, cordate, toothed: fls. light blue, to 1 in. long, in large branched panicles. S. Eu., Orient.—Garden material under this name may be *S. nemorosa*.

SALVINIA. *Salviniaceæ*. Floating flowerless annuals with small entire lvs. or fronds pimpled above; widely distributed. Grown in aquaria or greenhouse tanks, forming colonies on the surface of the water. Propagated by spores, or a single plant soon spreads.

auriculata (*S. natans. S. brasiliensis*). Lvs. nearly round, about ⅜ in. across. Trop. Amer.

brasiliensis: *S. auriculata*.

natans of the trade: *S. auriculata*.

SALVINIACEÆ. SALVINIA FAMILY. One of the fern allies: two genera of free-floating aquatics having two kinds of spores borne under the lvs. Azolla and Salvinia are grown in aquaria.

SAMANEA. *Leguminosæ*. Trop. American trees and shrubs with 2-pinnate lvs., fls. in heads, and flattened nearly straight pods; planted in the tropics for shade trees. Propagated by seeds.

Saman (*Pithecolobium* and *Inga Saman*). RAIN-TREE. MONKEY-POD. SAMAN or ZAMAN. To 80 ft. with branches often spreading to 100 ft.: fls. yellowish with very long pink stamens: pods to 8 in. long. W. Indies, Cent. Amer.

SAMARA: indehiscent winged pericarp, as of the maple and ash.

SAMBUCUS. ELDER. *Caprifoliaceæ*. Widely distributed shrubs or small trees, rarely herbs, having opposite pinnate lvs. with toothed lfts., small white wheel-shaped fls. in compound terminal corymbs or panicles, and fr. a small berry-like drupe.

Elders are effective when planted in mass, and are also somewhat grown for the fruit which is edible in some species. Most of the elders are hardy North and thrive in rich rather moist soil. Propagated by seeds, cuttings and some kinds by suckers.

aurea: yellow-lvd. races of *S. canadensis* and *S. nigra*.

cærulea (*S. glauca*). BLUE E. To 50 ft.: lvs. of 5–7 oblong lfts. to 6 in. long: fls. yellowish-white, in umbel-like cymes 6 in. across, June–July: fr. blue-black, glaucous. B. C. to Calif. and Utah. Var. **neo-mexicana** (*S. intermedia*) has 3–5 grayish-green lanceolate lfts. Ariz., New Mex. Var. **velutina** (*S. californica*) has densely pubescent lvs. Calif.

californica: *S. cærulea* var. *velutina*.

callicarpa (*S. racemosa* var. *callicarpa*). To 20 ft. and sometimes tree-like: lfts. oblong to obovate, pubescent underneath particularly on rib, sharp-toothed to tip: fr. scarlet, in showy clusters. Calif. to Wash.

canadensis. AMERICAN or SWEET E. To 12 ft., stoloniferous, with white pith: lvs. of usually 7 oval or lanceolate lfts. to 6 in. long: fls. white, in umbel-like cymes to 10 in. across, June–July: fr. purple-black, edible (with pomological vars.). N. S. to Fla. and Tex. Var. **acutiloba** (var. *laciniata*) has much dissected lfts. Var. **aurea** has golden-yellow lvs. and red frs. Var. **chlorocarpa** has greenish frs. Var. **maxima** is a larger form.

Ebulus. DWARF E. Herbaceous per. to 4 ft., with many sts.: lfts. narrow-oblong and long-pointed, sharp-serrate: fls. white tinged pink, in broad cymes: fr. small, black. Eu., N. Afr., Asia.

glauca: *S. cærulea*.

intermedia: *S. cærulea* var. *neo-mexicana*.

melanocarpa. To 12 ft.: lvs. of 5–7 oblong-lanceolate lfts. to 6 in. long: fls. yellowish-white, in an ovoid cyme to 3 in. across, July–Aug.: fr. black. B. C. to Calif.

nigra. EUROPEAN E. To 30 ft.: lvs. of usually 5 oval lfts. to 5 in. long: fls. yellowish-white, in umbel-like cymes to 8 in. across, May–June: fr. shining black. Eu., W. Asia, N. Afr. Some of the hort. vars. are: **albo-variegata**, lvs. variegated with white; **aurea**, lvs. golden-yellow; **aureo-variegata**, lvs. variegated with yellow; **laciniata**, lfts. deeply dissected; **heterophylla**, lfts. irregularly dissected; **pyramidalis**, habit columnar; **rotundifolia**, lfts. usually 3, broad-ovate.

pubens. AMERICAN RED E. To 15 ft., pubescent when young, with brownish-red pith: lvs. of 5–7 oblong lfts. to 4 in. long: fls. in rather loose pyramidal cymes to 4 in. long in which the lower branches are spreading, May: fr. scarlet, not edible. N. B. to Ga. and Colo. Var. **arborescens** is tree-like. Var. **leucocarpa** has white frs.

racemosa. European Red E. To 12 ft., glabrous: lvs. of 5–7 ovate or oval lfts. to 3 in. long: fls. yellowish-white, in dense ovoid panicles to 3 in. long with lower branches of it usually reflexed, Apr.–May: fr. scarlet. Eu., W. Asia. Var. **laciniata**, lfts. dissected. Var. **plumosa**, lfts. toothed to about middle, and golden-yellow in **plumoso-aurea**. Var. **tenuifolia**, lfts. finely dissected.

Sieboldiana. To 20 ft.: lvs. of usually 7 oblong lfts. to 8 in. long: fls. yellowish-white, in ovoid panicles to 3 in. long, Apr.–May: fr. scarlet. Japan, China.

SAMOLUS. *Primulaceæ.* Per. smooth herbs of wide distribution, having basal or alternate entire lvs. and small white fls. in racemes or panicles; sometimes planted for interest in moist places, but not showy.

Valerandi. To 1 ft.: lvs. obovate or oblong: fls. to ⅛ in. across, in racemes. Eu., Asia; sparingly intro. into N. Amer.—The native *S. floribundus* is larger but with smaller fls.

SAMPHIRE: *Crithmum maritimum.*

SAMUELA. Date Yucca. *Liliaceæ.* Trees resembling Yucca, with sharp-pointed narrow filiferous lvs. and white fls. in dense panicles, the perianth-segms. united; planted in Calif.

carnerosana. To 18 ft., the trunk usually simple: lvs. to 1½ ft. long and 3 in. wide: fls. to 4 in. across, the tube 1 in. long: fr. to 3 in. long. Mex.

Faxoniana. To 15 ft., trunk simple or branched at top: lvs. to 4 ft. long and 3 in. wide: fls. to 4 in. across, the tube ½ in. or less long: fr. to 3 in. long. W. Tex.

SANCHEZIA. *Acanthaceæ.* S. American herbs or shrubs with large opposite lvs. and orange, red or purple tubular fls. subtended by bracts and usually borne in spikes; one species grown as a foliage plant in the greenhouse and out-of-doors in S. U. S., as well as for its heavily bracted spikes of showy bloom. Propagated by cuttings.

nobilis. Shrub to 5 ft.: lvs. oblong-ovate, to 1 ft. long, abruptly acuminate: fls. yellow, 2 in. long, with narrow revolute rim, stamens exserted, bracts red, to 1½ in. long. Ecuador. Var. **glaucophylla** has lvs. variegated or blotched along veins with white or yellow.

spectabilis: hort. name, probably for *S. nobilis* var. *glaucophylla.*

SANDALWOOD: *Santalum.* **Bastard-:** *Myoporum sandwicense.* **Tree, Red:** *Adenanthera pavonina.*

SANDBOX-TREE: *Hura crepitans.*

SANDWORT: *Arenaria.*

SANGUINARIA. *Papaveraceæ.* One little spring-blooming per. herb with red juice, native in E. N. Amer. on rich lands and sometimes transplanted to the wild-garden. S. **canadensis.** Bloodroot. Lvs. basal, palmately lobed, to 1 ft. across: fls. white, sometimes tinged with pink, to 1½ in. across, solitary on scapes about 8 in. high: fr. a narrow caps. to 1 in. long: rootstocks prominent.

SANGUISORBA. Burnet. *Rosaceæ.* Per. hardy herbs native in north temp. zone, with alternate pinnate lvs., small bisexual or unisexual fls. without petals borne in heads or spikes, and fr. an achene inclosed in the calyx-tube. Grown in borders and *S. minor* for the lvs. used in flavoring. Propagated by seeds and division. See *Poterium.*

canadensis (*Poterium canadense*). To 6 ft.: lfts. 7–17, oblong, to 3 in. long, toothed: fls. bisexual, white, in spikes to 6 in. long. Newf. to Mich. and Ga.

dodecandra (*S. Vallistellinæ*). To 3 ft.: lfts. 13–19, linear-oblong, toothed: fls. bisexual, greenish-yellow, in drooping spikes 2 in. and more long. Eu.

media: the plant cult. under this name may be either *S. canadensis* or *S. Menziesii.*

Menziesii. To 3 ft.: lfts. 11–15, oval, to 2½ in. long, toothed: fls. purple, in spikes about 1 in. long. Alaska to Wash.

minor (*Poterium Sanguisorba*). To 2 ft.: lfts. 7–19, oval, to ¾ in. long, deeply toothed: fls. bisexual and unisexual, greenish, in dense heads about ½ in. long. Eu., Asia, E. N. Amer.

obtusa (*S. obtusata. Poterium obtusum*). To 3 ft.: lfts. about 13, oblong, toothed: fls. crimson, in spikes 3 in. long, nodding at tips. Japan.

obtusata: *S. obtusa.*

officinalis. To 5 ft.: lfts. 7–13, lanceolate-oblong to 3 in. long, toothed: fls. dark purple, in spikes about 1 in. long. Eu., Asia; somewhat nat. in N. Amer.

spinosa: *Poterium spinosum.*

tenuifolia (*Poterium tenuifolium*). To 4 ft. or more: lfts. many, linear-oblong, to 3 in. long, deeply toothed: fls. white or varying to purple, in spikes to 2 in. long. N. Asia.

Vallistellinæ: *S. dodecandra.*

SANSEVIERIA. Bowstring-Hemp. *Liliaceæ.* Per. herbs with short thick rootstocks, very thick and stiff erect long basal lvs. which are often variegated and mottled, and whitish or yellowish narrow fls. in racemes or spikes on slender scapes, the perianth-segms. united into a tube.

Sansevierias are commonly grown as durable porch and house plants in the North and out-of-doors in the South; some kinds are naturalized in warm countries. Of easy culture in a rather heavy soil. Propagated by division; also by cuttings of the leaf about 3 inches long and placed in sand, from which a stolon-like part is produced.

cylindrica. Lvs. to 5 ft. long and 1¼ in. thick, cylindrical or slightly flattened, striped and transversely banded with dark green: fls. white or tinged with pink, 1½ in. long. Trop. Afr.

grandiscuspis. Lvs. to 20 in. long and 1½ in. wide, nearly flat or channelled, narrowed into green point to 2 in. long, transversly banded with pale green, lined down back. Habitat unknown.

guineensis: *S. thyrsiflora.*

Kirkii. Lvs. to 6 ft. or more long and 3½ in. wide, flat or concave, the petiole deeply channelled, wavy-margined, grayish-green mottled or slightly barred with pale green, lined on back: fls. greenish, to 5 in. long. Trop. Afr.

Laurentii: *S. trifasciata* var.

pumila: name of uncertain application, but probably a juvenile form of *S. grandiscuspis.*

suffruticosa. Lvs. to 2 ft. long and ¾ in. wide, cylindrical, slightly banded with pale green, lined with darker green, rough: fls. whitish or greenish-white, ½ in. long. E. Afr.

thyrsiflora (*S. guineensis*). Lvs. to 1½ ft. long and 3½ in. wide, nearly flat but narrowing into channeled petiole, margined with yellow and banded transversely with pale green: fls. greenish-white, 1½ in. long, fragrant. S. Afr.

trifasciata var. **Laurentii.** Resembling *S. zeylanica* but lvs. longitudinally striped with golden-yellow. Belgian Congo.

zeylanica. Lvs. to 2½ ft. long and ¾ in. wide, concave at middle, transversely banded with light green and lined down back: fls. greenish-white, 1½ in. long. Ceylon.—Plants are not likely to be true to name.

SANTALACEÆ. Sandalwood Family. More or less parasitic herbs or shrubs, about 30 widely distributed genera, having alternate or opposite entire lvs., bisexual or unisexual fls. with 3–6-lobed perianth, 3–6 stamens, usually inferior 1-celled ovary, and fr. a nut or drupe. Buckleya is sometimes cult.; sandalwood of commerce is obtained from Santalum.

SANTALUM. SANDALWOOD. *Santalaceæ.* Evergreen trees or shrubs native in India, Malaya and Australia, with opposite lvs., bisexual fls. in panicles, and drupaceous frs. Oil is extracted from the sweet-scented wood which is used as a perfume.

album. WHITE S. Small tree: lvs. ovate to ovate-lanceolate, to 2 in. long: fls. yellowish turning to red, in short panicles: fr. black. India.—Sometimes planted in warm countries.

SANTOLINA. *Compositæ.* Low evergreen shrubs or rarely herbs with aromatic alternate small lvs. pinnately toothed, lobed or finely divided, and many-fld. heads of yellow or rarely white disk-fls.; pappus none; native mostly in the Medit. region.

Santolinas are employed as low border or edging plants. Propagated by cuttings taken in spring from plants wintered over in a frame or they may be taken from the plants in the fall before frost.

Chamæcyparissus (*S. incana*). LAVENDER-COTTON. Evergreen subshrub to 2 ft.: lvs. pinnate into minute segms., silvery-gray-tomentose: heads solitary, to ¾ in. across, yellow, globular. Medit. region.—Often persisting in cemeteries and old yards.

incana: *S. Chamæcyparissus.*

rosmarinifolia. To 2 ft.: lvs. linear, entire or slightly toothed: heads solitary, globular. S. Eu.

SANVITALIA. *Compositæ.* American ann. herbs with opposite usually entire lvs. and small solitary heads, the rays white or yellow, the disks brown or purple; pappus of awns or teeth or none.

One sanvitalia is grown as a flower-garden annual; it prefers a light or open soil and full sunlight. Propagated by seed.

procumbens. Ann. with trailing sts., hairy: lvs. ovate, to 1 in. long: heads ¾ in. across, rays yellow, disk dark purple. Mex.

SAPINDACEÆ. SOAPBERRY FAMILY. A heterogeneous assemblage, mostly trees and shrubs, but in a few cases herbaceous and tendril-climbing, of about 125 genera, sometimes evergreen, the larger number in trop. regions of both hemispheres: lvs. usually alternate and pinnately or palmately compound: fls. unisexual or polygamous, having 4–5 sepals and petals or apetalous, 5–10 stamens, and superior 2–4-celled ovary: fr. of many kinds, often berry-like or drupe-like, sometimes a caps. or nut or winged body, in some cases a greatly inflated pod. Several genera are grown for the edible fr. and for ornament, as Alectryon, Blighia, Cardiospermum, Cupania, Diploglottis, Dodonæa, Euphoria, Kœlreuteria, Litchi, Melicocca, Paullinia, Sapindus, Serjania, Ungnadia, Xanthoceras.

SAPINDUS. SOAPBERRY. *Sapindaceæ.* Trop. trees and shrubs with commonly pinnate lvs., small regular polygamous fls. in panicles or racemes, and fr. a fleshy or leathery berry; grown in the S. for ornament.

The fruits are rich in saponin which is employed for cleansing purposes in some countries. They thrive in sandy or dry and rocky soil. Propagated by seeds and cuttings in spring.

Drummondii. Deciduous tree to 50 ft.: lvs. of 8–18 lanceolate lfts. to 3 in. long: fls. yellowish-white, in panicles to 10 in. long: fr. round, yellow turning black, to ½ in. across. Mo. to Mex.

Mukorossi. Evergreen brittle tree: lvs. of 8–13 oblong-ovate or -lanceolate lfts. to 6 in. long, the lf.-stalk narrowly winged: fr. yellow or orange-brown, ¾ in. across. India to Japan.—The fr. has a large content of saponin; planted in Fla.

Saponaria. Evergreen tree to 30 ft.: lvs. of 7–9 elliptic to oblong-lanceolate lfts. to 4 in. long, the lf.-stalk usually broadly winged: fls. white, the panicles to 10 in. long: fr. round, orange-brown and shining, to ¾ in. across. Trop. Amer.

SAPIUM. *Euphorbiaceæ.* Trop. trees and shrubs with milky juice, alternate simple lvs., monœcious fls. without petals borne in spikes, and capsular fr.; several species furnish rubber and the waxy seed-covering of *S. sebiferum* is used in making candles, soap, and dressing for cloth. Propagated by seeds or cuttings or varieties are top-grafted on seedling stocks.

sebiferum (*Stillingia sebiferum*). CHINESE TALLOW-TREE. VEGETABLE-TALLOW. Tree to 40 ft.: lvs. rhombic-ovate, to 3 in. long, abruptly acuminate: spikes to 4 in. long: fr. ½ in. across, the 3 large white seeds adhering to the central column. China, Japan; nat. in S. U. S.—With us it is known as a shade, ornamental or specimen tree; it has something the aspect of a poplar.

SAPODILLA: *Sapota Achras.*

SAPONARIA. SOAPWORT. *Caryophyllaceæ.* Hardy herbaceous erect or spreading annuals and perennials with flat broad lvs. and red, pink or white fls. in cymes or panicles; native in Eu., Asia and N. Afr., a few grown in rockeries and borders. Of easy cult., thriving in any soil. Propagated by seed or division.

bellidifolia. Glabrous tufted per. to 16 in.: lvs. spatulate: fls. yellow, in heads about 1 in. across at top of sts. S. Eu. to Greece.

cæspitosa. Tufted, with sts. to 6 in. high: lvs. linear: fls. rose, in 2–3-fld. cymes. Pyrenees.

calabrica (*S. multiflora*). Ann., sticky-hairy above: lvs. oblong-lanceolate: fls. pale rose, about ½ in. across, solitary in axils forming leafy panicles, spring. Italy, Greece. Var. **alba**, fls. white.

caucasica: *S. officinalis* var.

lutea. Tufted, to 6 in.: lvs. linear: fls. yellow, in dense heads, stamens violet. Eu.

multiflora: *S. calabrica.*

ocymoides. Per., trailing, much branched, to 9 in., soft-hairy: lvs. ovate-lanceolate: fls. bright pink, in broad loose cymes, calyx purple, May–Aug. Cent. and S. Eu. Var. **alba**, fls. white. Var. **splendens**, fls. larger and deeper rose.

officinalis (*Silene Saponaria*). BOUNCING BET. Stout glabrous per., little branched, to 3 ft.: lvs. ovate-lanceolate, to 3 in. long: fls. pink or whitish, about 1 in. across, in dense terminal corymbs, May–Sept. W. Asia; widely nat. in N. Amer. Double-fld. forms are **flore-pleno**, **caucasica** and **caucasica flore-pleno**.

Vaccaria (*Vaccaria vulgaris. Lychnis Vaccaria*). COW-HERB. Ann., glabrous, to 3 ft.: lvs. ovate-lanceolate: fls. deep pink, ½ in. across, in loose cymes. Eu.; widely nat. in N. Amer. Var. **alba** has white fls.

SAPOTA. *Sapotaceæ.* One evergreen tree cult. in the tropics for its delicious fr., native of trop. Amer. S. **Achras** (*Achras Sapota*). SAPODILLA. To 75 ft.: lvs. oblong to elliptic, to 5 in. long, shining: fls. white, to ½ in. across, solitary, axillary: fr. to 3½ in. diam., rough, brown with yellow-brown translucent flesh and black shining seeds.

The sapodilla grows well in any usual soil but seems to prefer fertile sandy loam. Trees should not be planted closer than 25–30 feet; they require little pruning as their growth is more or less compact. Propagation is usually by seed but a better method, perhaps, is by shield-budding on common seedling stocks. Grafting and layering are also methods in India.

SAPOTACEÆ. Sapodilla Family. Mostly trop. and subtrop. trees and shrubs in both hemispheres, with milky juice, alternate simple and entire lvs., regular bisexual fls. having 4–6 separate sepals, gamopetalous corolla, as many stamens as corolla-lobes, superior ovary, and fr. a berry. There are more than 30 genera in the family of which several yield edible fr. and one gutta-percha. Those known to hort. are Achras, Argania, Bumelia, Chrysophyllum, Lucuma, Palaquium, Sapota, Sideroxylon.

SAPOTE: *Achras Zapota.* **Black:** *Diospyros Ebenaster.* **White:** *Casimiroa edulis.*

SARACA. *Leguminosæ.* Trop. Asian trees with pinnate lvs., fls. in panicled racemes, and flattened leathery or woody pods; grown for ornament in trop. regions and sometimes under glass.

cauliflora. Bush-like tree: lfts. 1 ft. or more long: fls. scarlet. India.

indica. Asoka. Sorrowless Tree of India. Small tree: lfts. to 9 in. long: fls. orange-red, fragrant: pods to 10 in. long. India, Malaya.

SARCANTHUS. *Orchidaceæ.* Epiphytes with sts. bearing small stiff lvs. and small fls. in panicles, the sepals and petals similar, the lip spurred and united with base of column. See *Orchids* for cult.

Williamsoni. Lvs. cylindrical: fls. amethyst-purple. Burma.

SARCOCHILUS. *Orchidaceæ.* Old World epiphytic orchids with short leafy sts. and fls. in racemes, the sepals and petals nearly equal, the lip usually 3-lobed and spurless. See *Orchids* for cult.

calceolus: *Thrixspermum calceolus.*

pallidus (*S. unguiculatus*). Lvs. to 6 in. long and 2 in. wide: fls. 1½ in. across, in few-fld, pendulous racemes shorter than lvs.; sepals and petals yellow; lip almost white marked with violet, blooming all year. Philippines.

unguiculatus: *S. pallidus.*

SARCOCOCCA. *Buxaceæ.* Evergreen Asian long-leaved shrubs with alternate entire lvs. and unisexual fls. without petals borne in short axillary racemes; sometimes planted for the attractive foliage; useful in southern states. Propagated by seeds and cuttings.

Hookeriana. To 6 ft.: lvs. lanceolate, to 3 in. long: fr. black. Himalayas.

pruniformis: *S. saligna.*

ruscifolia. To 6 ft.: lvs. ovate, to 2 in. long, lustrous dark green above: fls. whitish: fr. red. China.

saligna (*S. pruniformis*). Lvs. lanceolate-oblong, to 5 in. long, caudate-acuminate: fls. yellow: fr. purple. Himalayas.

SARCOGLOTTIS. *Orchidaceæ.* Terrestrial orchids closely allied to Spiranthes but differing in the reflexed tips of the sepals and the curved lip; native mostly in trop. Amer.

picta (*Spiranthes picta*). To 2 ft.: lvs. oblong, to 6 in. long: fls. greenish-white, about ⅓ in. long, in spikes to 6 in. long, Feb. Cent. Amer., Trinidad, Guiana, Brazil.

SARCOPODIUM: *Dendrobium.*

SARGENTODOXA: see *Lardizbalaceæ.*

SARRACENIA. Pitcher-Plant. *Sarraceniaceæ.* Insectivorous plants sometimes grown as curiosities: stemless perennials with basal hollow lvs. or "pitchers" winged or keeled on one side and with a lid at top, solitary nodding yellow to dull crimson fls. with an umbrella-like stigma, and capsular frs.

Pitcher-plants are natives of moist or swampy places and should be grown in pots of fine sandy muck standing in about 1 inch of water. They withstand temperatures nearly to freezing (below freezing in native places when dormant), and *S. purpurea* is hardy North. Propagated by seeds which are obtained only by cross-pollination.

Catesbæi: *S. Sledgei.*

Drummondii. Pitchers to 4 ft. long, green below veined with purple, the lid nearly erect and wavy-margined: fls. purple, to 4 in. across. Ga., Fla., Ala.

flava. Pitchers to 3 ft. long, yellowish-green with crimson throat or sometimes entirely crimson, the lid slightly bent over mouth: fls. yellow, to 4 in. across. Va. to Fla.

minor (*S. variolaris*). Pitchers to 2 ft. long, veined toward top with green and purple and blotched with white or yellow, the lid bent over mouth: fls. pale yellow, to 2 in. across. N. C. to Fla.

psittacina. Pitchers decumbent, to 6 in. long, veined and spotted with purple and white, the lid strongly bent: fls. purple or greenish-purple, to 2 in. across. Ga., Fla., Ala.

purpurea. Pitchers to 10 in. long, green to dark purple, the lid nearly erect: fls. purple or greenish-purple, to 2 in. across. Labrador to Fla. and Rocky Mts.

rubra. Pitchers to 20 in. long, veined with purple, the lid slightly bent: fls. crimson, fragrant, to 2 in. across. N. C. to Fla.

Sledgei (*S. Catesbæi*). Pitchers to 2½ ft. long, veined with purple, the lid erect or slightly bent: fls. yellow fading to white, to 2½ in. across. Ala. to Tex.—There is another *Catesbæi* which is a hybrid between *S. flava* and *S. purpurea.*

variolaris: *S. minor.*

SARRACENIACEÆ. Sarracenia Family. Three genera of specialized insectivorous low herbs native in N. and S. Amer., Darlingtonia, Heliamphora and Sarracenia, sometimes cult. as fancier's plants or for botanical demonstration. The family is characterized by basal tubular pitcher-like or trumpet-form lvs., bisexual fls. having 5 sepals and petals, numerous stamens, superior 3–5-celled ovary, and capsular frs.

SARSAPARILLA: *Aralia.*

SASA. *Gramineæ.* Shrubs, mostly dwarf or not very tall, with cylindrical culms, persistent lf.-sheaths, lvs. crowded at ends of branches, tessellate, and narrow spikelets borne in loose panicles, stamens usually 6; native in E. Asia and the Philippines. Many of them stand as far north as Washington and Philadelphia. See *Bamboo.*

albo-marginata: *S. Veitchii.*

argenteo-striata (*Bambusa argenteo-striata*). Probably only a silver-striped form of *S. auricoma*.

aureo-striata (*Arundinaria* and *Bambusa aureo-striata*). Probably a hort. form of *S. auricoma*.

auricoma (*Arundinaria auricoma. Bambusa Fortunei aurea. B. viridi-striata*). To 4 ft., sts. purplish-green: lvs. to 8 in. long and 1 in. wide, finely toothed, pubescent, striped green and yellow. Japan.

chrysantha (*Arundinaria* and *Bambusa chrysantha*). To 6 ft.: lvs. to 5 in. long and ¾ in. wide, glabrous, often variegated with yellow. Japan.

disticha (*Bambusa disticha. B. angustifolia. B. Vilmorini*). To 2½ ft.: lvs. to 2½ in. long and ⅓ in. wide, finely toothed, bright green. Japan.

humilis (*Arundinaria humilis. A. gracilis*). To 3 ft.: lvs. to 6 in. long and ¾ in. wide, pale green, nearly glabrous, lf.-sheaths bristly at apex. Japan.

japonica (*Arundinaria japonica. A. Metake. Bambusa japonica. B. Metake*). To 15 ft., the st.-sheaths bristly-hairy: lvs. to 10 in. long and 1½ in. wide, finely toothed, shining above, glaucous beneath. Japan.

paniculata: *S. senanensis*.

pumila (*Arundinaria pumila*). To 2 ft., st.-sheaths tessellate: lvs. to 6 in. long and ¾ in. wide, toothed, hairy. Japan.

pygmæa (*S. variegata* var. *pygmæa. Arundinaria pygmæa*). To 2 ft., much branched: lvs. to 5 in. long and 1 in. wide, hairy. Japan.

senanensis (*S. paniculata*). To 6 ft., st.-sheaths with ciliate tongue: lvs. to 1 ft. long and 3 in. wide, shining above, glaucous beneath. Japan. Var. **nebulosa** (*Arundinaria* and *Bambusa palmata*) has purplish sts. and st.-sheaths spotted with brown.

tessellata ((*Arundinaria tessellata. A. Ragamowski. Bambusa tessellata. B. Ragamowski*). To 5 ft.: lvs. to 1½ ft. long and 4 in. across. toothed, glaucous and pubescent beneath. Japan.

variegata (*Arundunaria Fortunei*). To 3 ft.: lvs. to 6 in. long and ¾ in. wide, toothed, hairy, striped with white. Japan.

Veitchii (*S. albo-marginata. Arundinaria* and *Bambusa Veitchii*). To 3 ft., usually lower: lvs. to 8 in. long and 2½ in. wide, glaucous and pubescent beneath, edges turning yellow, lf.-sheaths with bristly tips. Japan.

SASSAFRAS. *Lauraceæ*. Three aromatic deciduous trees, one native in N. Amer., one in Asia, one on Isl. of Formosa, with alternate entire or lobed lvs., unisexual or bisexual fls. before the lvs., and drupaceous fr. having a fleshy pedicel. Of easy cult. Propagated by seeds, suckers, and root-cuttings.

officinale: *S. variifolium*.

variifolium (*S. officinale*). SASSAFRAS. To 60 ft. or more: lvs. ovate, to 5 in. long, entire or 1–3-lobed at apex, pale beneath: fls. yellow, in racemes to 2 in. long: fr. dark blue, with bright red stalks. Me. to Fla. and Tex.

SATIN-FLOWER: *Lunaria*.

SATUREJA (incl. *Calamintha*). SAVORY. *Labiatæ*. Hardy aromatic herbs and sub-shrubs of warm countries, grown in borders for their bloom and also as sweet-herbs: lvs. narrow, entire or broader and toothed: fls. whorled, in simple spikes or raceme-like panicles.

Savory is propagated by seed sown in the permanent position; also by division and cuttings of the new growth, in the case of the perennials.

alpina (*C. alpina*). ALPINE S. Per., much branched and woody at base, 6 in.: lvs. ovate, ½ in. long, slightly toothed: fls. purple. Medit. region.

Calamintha (*C. officinalis* and *C. montana. Clinopodium Calamintha*). CALAMINT. Small hairy-pubescent per., with creeping rootstocks, 1–2 ft. high: lvs. broad-ovate, obtuse, dentate: fls. small, in separated leafy whorls, lilac. Eu.—Sometimes confused as to name with *S. montana*.

hortensis (*C. hortensis*). SUMMER S. Ann. to 1½ ft.: lvs. soft, oblong-linear, to 1½ in. long: fls. pink, purplish or white. Eu.; nat. in E. U. S.

montana (*C. montana* and *officinalis*). WINTER S. Per. or subshrub to 15 in.: lvs. stiff, oblong-linear, to 1 in. long, sessile and bases joined by ridge: fls. white or purplish. Eu., N. Afr.

Nepeta (*C.* and *Clinopodium Nepeta*). Per. to 16 in.: lvs. ovate, to 1 in. long, slightly toothed: fls. purplish or white. Eu., Asia; nat. in N. Amer.

SAUROMATUM. *Araceæ*. A few per. herbs with a large solid corm-like underground tuber from which arise the short scape and large pedate lf., one species sometimes planted for ornament and curiosity: somewhat arisæma-like but scape separate from petiole-sheath: native in Himalayas and Afr. Some forms stand in N. Y. with protection.

guttatum (*Arum guttatum*). Tuber 3–6 in. diam.: scape 2–4 in. long, direct from tuber, usually before lf.: spathe narrow and long-tailed, 1–2 ft. or more, dull purple or yellowish spotted and blotched purple: lfts. or segms. 5–15, long oblong-lanceolate, pointed, 6–12 in. long. Himalaya and subtrop. E. Asia.—Variable, and has been grown in one of its forms as *Arum cornutum* and "red calla." Var. **pedatum** (*S.* and *Arum pedatum*). Petiole green, not spotted: spathe about 1 ft. long, yellowish and purple-spotted inside. Var. **punctatum** (*S. punctatum*). Petiole spotted: spathe brown-spotted at base, striate. Var. **simlense** (*S. simlense*). Small or depauperate: lf. 5-parted: spathe 4 in. or less long. Var. **venosum** (*S.* and *Arum venosum*). Lf.-segms. 7–11, petiole with long spots.

pedatum: *S. guttatum* var.

punctatum: *S. guttatum* var.

simlense: *S. guttatum* var.

venosum: *S. guttatum* var.

SAURURACEÆ. LIZARDS-TAIL FAMILY. Per. herbs of 3 genera in N. Amer. and Asia, having alternate entire lvs., small fls. without perianth in racemes or spikes that are sometimes subtended by corolla-like bracts, 6 or 8 stamens, ovary of 3 or 4 carpels, and capsular frs. Anemopsis, Houttuynia and Saururus may be planted.

SAURURUS. LIZARDS-TAIL. *Saururaceæ*. Herbs in wet or moist situations, with heart-shaped lvs. and fls. in dense terminal spikes or racemes. Propagated by division or seeds.

cernuus. To 5 ft., with long rootstocks: lvs. ovate, to 6 in. long, palmately veined: fls. white, fragrant, in spikes to 6 in. long. Conn. to Fla. and Tex.

SAUSAGE-TREE: *Kigelia pinnata*.

SAUSSUREA. *Compositæ*. Herbs of the north temp. zone (1 Australian) with alternate entire, toothed or pinnate lvs. and heads of purple or bluish disk-fls.; pappus of bristles. Sometimes planted for ornament. The name Saussurea has been applied also to Hosta.

deltoidea. Per. to 8 ft.: lvs. triangular-ovate or lower lyrate-pinnatifid, to 1½ ft. long, white-tomentose beneath: heads to 1½ in. across, in leafy panicles. Himalayas.

SAVANNAH FLOWER: *Echites tomentosa*.

SAVIN: *Juniperus Sabina*.

SAVORY: *Satureja*.

SAXEGOTHÆA. *Taxaceæ*. One evergreen tree native to Chile, **S. conspicua**. To 45 ft.: lvs. yew-like, linear, to 1 in. long, dark green above, with 2 broad white bands beneath: male fls. in short spikes: fr. cone-like, about ½ in. across, with several seeds.—To be grown far south in E. U. S. and in Calif. For cult. see *Conifers*.

SAXIFRAGA. SAXIFRAGE. ROCKFOIL. *Saxifragaceæ*. Many attractive herbaceous perennials, a few ann. or bien., of diverse character and appearance, by some authors arranged in several genera: lvs. usually basal and clustered, those on the sts. commonly smaller: fls. white, pink, purple or yellow, in racemose, paniculate or cymose clusters, blooming commonly in late spring and early summer: native in temp. and subarctic regions, mostly in the mts. and in rocky places, many adapted to the rock-garden, a few to the border, while one (*S. sarmentosa*) is often grown as a window- and basket-plant.

Saxifrages are much prized by fanciers but are relatively little grown in North America. They require the usual treatment for rock-garden or border perennials. Increased by seed, by division and in some species by runners, also by the bulblets which some kinds produce.

affinis: *S. hypnoides*.

aizoides (*Leptasea aizoides*). To 6 in.: lvs. linear-oblong or oblong, to ½ in. long, thick: fls. yellow, to ⅕ in. long, solitary or several. Arctic N. Amer., Eu., Asia.

Aizoon (*Chondrosea Aizoon*). To 20 in.: lvs. in dense basal rosettes, narrow-spatulate, to 1¼ in. long, with incrusted white teeth: fls. creamy marked with purple, to ½ in. across. Arctic N. Amer., Eu., Asia. Var. **baldensis**. Lvs. ashy-gray, short and thick. N. Italy. Var. **brevifolia**, fls. white. Var. **flavescens**, fls. lemon-yellow. Var. **lutea**, fls. yellow. Var. **notata**, lvs. margined with silver. Var. **paradoxa**, lvs. bluish, fls. white. Var. **pectinata**, lvs. margined with silver, fls. white spotted red. Var. **rosea**, fls. bright pink. Var. **Stabiana** (*S. Stabiana*). To 8 in.: lvs. to 1 in. long.

Allionii: *S. moschata* var.

altissima. To 2 ft.: lvs. in basal rosettes, broadly tongue-shaped, to 4 in. long, with cartilaginous teeth: fls. white, slightly spotted with purple, ½ in. across. Tyrol.

Andrewsii. Hybrid between *S. Aizoon* and *S. Geum:* to 6 in.: fls. white spotted with red.

apennina: *S. cuneifolia* var. *subintegra*.

apiculata. Hybrid between *S. Rocheliana* and *S. sancta:* to 3½ in.: fls. yellow. Var. **Malyi** (*S. Malyi*) has deeper yellow fls.

aquatica. To 20 in.: lvs. orbicular, about 1 in. wide, 3-lobed: fls. white, ¾ in. across. Pyrenees.

arachnoidea. Tufted, with procumbent sts. to 1 ft. long, densely hairy: lvs. 3–5-lobed, to ¾ in. long: fls. yellow. Cent. Eu.

aretioides. To 2 in., densely tufted: lvs. leathery and stiff, linear, to ¼ in. long, the margins cartilaginous: fls. golden-yellow, ½ in. across. Eu.

atropurpurea: *S. moschata* var.

austromontana (*Leptasea austromontana*). To 3 in., densely tufted: lvs. lanceolate, about ½ in. long, ciliate: fls. white spotted with yellow, ½ in. across. B. C. to New Mex.

baldensis: *S. Aizoon* var.

bathoniensis: *S. decipiens* var.

Bertolonii. Hybrid between *S. Friderici-Augusti* and *S. porophylla*: to 3 in.: fls. red.

Borisii. Hybrid between *S. marginata* and *S. Ferdinandi-Coburgi*: to 3 in.: fls. yellow.

Boryi. To 1½ in., tufted: lvs. oblong-spatulate: fls. white, to ⅓ in. long. S. E. Eu.

Boydii. Hybrid between *S. aretioides* and *S. Burseriana:* fls. yellow.

bronchialis. To 8 in., tufted: lvs. stiff, linear, to ½ in. long, ciliate: fls. yellowish-white, spotted with reddish, ½ in. across. Asia, Alaska.

Burseriana. To 4 in. deeply tufted: lvs. stiff, linear-subulate, to ½ in. long, the margins cartilaginous: fls. white, usually solitary, 1 in. across. Eu. Var. **grandiflora** has larger fls., also var. **magna**.

cæsia. To 3 in., densely tufted: lvs. linear-oblong, ⅕ in. long: fls. white, about ½ in. across, 1–2 together. Eu.

cæspitosa (*Muscaria cæspitosa*). To 6 in., tufted: lvs. 3-lobed, about ½ in. long: fls. white, ½ in. or less across. N. N. Amer., N. Eu., N. Asia.

Camposii (*S. Wallacei*). To 6 in.: lvs. 3-lobed, shining: fls. white, ¾ in. across. Spain.

capillaris: *S. cuneifolia*.

cartilaginea (*S. Kolenatiana*). To 9 in.: lvs. in rosettes, oblong, to 1 in. long, the margins cartilaginous: fls. white, rose or purple, about ½ in. across. Asia Minor.

ceratophylla: *S. trifurcata* var.

cochlearis. To 9 in., densely tufted: lvs. linear-spatulate, to 1 in. long, margins cartilaginous: fls. white, to ¾ in. across. Alps. Var. **minor** has minute rosettes of silvery lvs.

conifera. To 3 in., densely tufted: lvs, oblong-linear, leathery, margins ciliate: fls. white, Spain.

cordifolia: *Bergenia cordifolia*.

coriophylla. To 2 in., densely tufted: lvs. oblong, to ¼ in. long: fls. white, about 1 in. across. Eu.

corymbosa (*S. luteo-viridis*). To 6 in., densely tufted: lvs. spatulate, to 1 in. long, with cartilaginous margins: fls. pale yellow or yellowish-green, ¼ in. across. Eu.

Cotyledon. To 2 ft.: lvs. in rosettes, tongue-shaped, to 3 in. long, toothed: fls. white veined with pink, fragrant, to ¾ in. across. Mts. of Eu. Var. **pyramidalis** (*S. pyramidalis, S. nepalensis*) grows to 4 ft.

crassifolia: *Bergenia crassifolia*.

crustata. To 1 ft., densely tufted: lvs. linear, to 1½ in. long, crustated with lime: fls. white, sometimes marked with purple at base. ⅖ in. across. Tyrol.

cuneifolia (*S. capillaris*). To 1 ft.: lvs. in rosettes, broad-spatulate, to 1½ in. long, rounded and toothed at apex: fls. white, yellowish at base, ¼ in. across. Eu. Var. **subintegra** (*S. apennina*) has nearly entire lvs.

cuscutæformis. To 6 in., with thread-like stolons, lvs. basal, oval, to 2 in. long, coarsely toothed or wavy, veined with white: fls. white, 1 in. across, petals very unequal. Japan.

Cymbalaria. Ann. or bien. to 1 ft.: lvs. kidney-shaped or ovate, to 1 in. long, lobed or crenate: fls. yellow, to ½ in. across. Caucasus. Asia Minor.

decipiens. To 1 ft. but usually lower, tufted: lvs. obovate-cuneate, cut into 3–5 linear lobes: fls. white, about ½ in. across. Eu. Runs into many hort. vars., a few of which are: **Arkwrightii**, fls. to 1 in. across; **bathoniensis** (*S. bathoniensis*), fls. scarlet.

densa: *S. moschata* var.

elatior: *S. Hostii*.

Elizabethæ. Hybrid between *S. Burseriana* and *S. sancta:* to 2 in.: fls. yellow.

Engleri. Hybrid between *S. Aizoon* and *S. cuneifolia*: to 4 in.: fls. very small.

exarata. To 6 in., tufted: lvs. 3-parted or -lobed: fls. white varying to rose or purple. Mts. of S. Eu.

Ferdinandi-Coburgi. To 2 in., densely tufted: lvs. oblong, to ½ in. long, ciliate: fls. yellow, about ½ in. across. Macedonia.

Friderici-Augusti. To 6 in., tufted: lvs. linear-lanceolate or spatulate, entire: fls. violet-purple, in spike-like racemes. S. E. Eu., Asia Minor.

Gaudinii. Hybrid between *S. Aizoon* and *S. Cotyledon:* rosettes silvery-gray: fls. white.

geranioides. To 10 in., tufted: lvs. palmately 3-lobed, the lobes 2–3-toothed: fls. white, ⅓ in. long. Mts. of Eu.

Geum (*Micranthes Geum*). To 1 ft.: lvs. nearly orbicular, to 1 in. across, coarsely toothed, on very long petioles: fls. white, ¼ in. across. Eu., Newf.

globulifera. To 4 in., tufted: lvs. spatulate, ½ in. long, usually 3-lobed, petioles dilated at base: fls. white, ⅖ in. across. S. Spain, N. Afr.

Godseffiana. Hybrid between *S. sancta* and *S. Elizabethæ*: to 4 in.: fls. deep yellow.

granulata. MEADOW S. To 20 in., bulbous at base and with numerous bulblets in axils of basal lvs.: lvs. kidney-shaped, to 1 in. long and 1½ in. wide, lobed:

fls. white, 1 in. across. Eu., N. Afr. Var. **flore-pleno** has double fls.

Grisebachii. To 8 in., tufted: lvs. spatulate, to 1½ in. long, the margins cartilaginous: fls. purple, ⅙ in. or less across. Medit. region.

Haagii. Hybrid between *S. Ferdinandi-Coburgi* and *S. sancta:* to 3 in.: fls. golden-yellow, to ½ in. across.

Haussmannii. Hybrid between *S. mutata* and *S. aizoides*: to 8 in.: fls. yellow.

hibernica: *S. Sternbergii.*

Hostii (*S. elatior*). To 2 ft.: lvs. in rosettes, tongue-shaped, to 4 in. long, wavy-margined and encrusted with lime: fls. white sometimes dotted with purple, ½ in. across, in many-fld. panicles. Eu.

Huetiana. Ann. or bien. to 6 in.: lvs. kidney-shaped, 5–7-lobed: fls. bright yellow, ⅖ in. across. Asia Minor.

hypnoides (*S. affinis. S. sponhemica*). To 6 in., having many barren shoots: lvs. linear, 1/12 in. long, sometimes 3–5-lobed and ½ in. long: fls. white, to 1 in. across. Eu. Var. **gemmifera** (*S. Kingii*) is a compact form.

irrigua. To 1 ft.: lvs. in rosettes, kidney-shaped, ½ in. long, deeply 3-lobed and the lobes toothed, on petioles to 2 in. long: fls. white, to 1 in. across, in many-fld. panicles. Eu.

Irvingii. Hybrid between *S. Burseriana* var. and *S. Friderici-Augusti*: to 1 in. or more: fls. pink with deeper center.

juniperifolia (*S. juniperina*). To 3 in., tufted: lvs. stiff, lanceolate, to ¾ in. long, ciliate: fls. yellow, ⅓ in. across. Caucasus.

juniperina: *S. juniperifolia.*

Kingii: *S. hypnoides* var. *gemmifera.*

Kolenatiana: *S. cartilaginea.*

lantoscana: *S. lingulata* var.

Leichtlinii: *Bergenia ligulata* var.

leucanthemifolia (*S. Michauxii. Hydatica petiolaris*). To 1½ ft.: lvs. oblanceolate, to 7 in. long, coarsely toothed: fls. white, ¼ in. across. Va. to Ga.

ligulata: *Bergenia ligulata.*

lingulata. To 1 ft., tufted: lvs. linear-spatulate, to 3 in. long, the margins recurved and encrusted: fls. white, ⅓ in. across. S. Eu. Var. **lantoscana** (*S. lantoscana*) has short blunt lvs.

longifolia. To 2 ft.: lvs. in rosettes, linear-spatulate, to 3 in. long, margins encrusted: fls. white, rarely purple-spotted, ½ in. across, in many-fld. panicles. Pyrenees.

luteo-viridis: *S. corymbosa.*

Macnabiana. Hybrid between *S. Cotyledon* and *S. lingulata:* fls. white spotted with purple.

Malyi: *S. apiculata* var.

marginata. To 3 in., tufted: lvs. obovate with cartilaginous margins, to ½ in. long: fls. white, to ½ in. long. S. Italy.

Mertensiana. To 1 ft.: lvs. cordate-orbicular, to 3 in. across, toothed, long-stalked: fls. white with yellow spots at base. Alaska to Calif.

Michauxii: *S. leucanthemifolia.*

moschata. To 5 in.: lvs. linear, entire or 2–3-lobed: fls. yellowish, rarely purplish or white. Eu. Var. **Allionii** (*S. Allionii*), fls. white. Var. **atropurpurea** (*S. atropurpurea*), fls. dark purple. Var. **densa** has densely packed foliage. Var. **Rhei** (*S. Rhei*), fls. rose.

muscoides. To 2 in., densely tufted: lvs. linear, ¼ in. long: fls. white or yellowish, ¼ in. across. Eu.

mutata. To 1 ft., with thick rhizome: lvs. in rosettes, thick, spatulate, to 3 in. long, very obtuse, the margins cartilaginous: fls. yellow or orange, about ½ in. across. Eu.

nepalensis: *S. Cotyledon* var. *pyramidalis.*

oppositifolia (*Antiphylla oppositifolia*). To 2 in., densely matted: lvs. obovate, keeled, to ⅓ in. long, ciliate: fls. rose or purple. to ½ in. across. Eu., Asia, N. N. Amer. Var. **pyrenaica** has large crimson fls.

orbicularis: *Bergenia crassifolia* var.

palmata: a name of uncertain application.

paradoxa: *S. Aizoon* var.

pectinata. Hybrid between *S. Aizoon* and *S. crustata:* fls. white spotted with purple.

pedemontana. To 4 in., tufted: lvs. 3-lobed, the lobes toothed, to ¾ in. long, petioled: fls. white, to 1 in. across. S. Eu.

peltata: *Peltiphyllum peltatum.*

pennsylvanica (*Micranthes pennsylvanica*). SWAMP S. To 3 ft., with thick rhizome: lvs. basal, oblong to spatulate, to 1 ft. long, ciliate: fls. greenish, to ¼ in. across. Me. to Va. and Mo.

Petraschii. Hybrid between *S. tombeanensis* and *S. Rocheliana*: to 2 in.: fls. white, 1 in. across.

porophylla. To 5 in., tufted: lvs. oblong-spatulate to linear, to ½ in. long, the margins cartilaginous: fls. pink or purple, ⅕ in. across. S. Eu.

primuloides: *S. umbrosa* var.

prolifera: listed name.

purpurascens: *Bergenia purpurascens.*

pyramidalis: *S. Cotyledon* var.

pyrenaica: *S. oppositifolia* var.

Rhei: *S. moschata* var.

Rocheliana. To 3 in., densely matted: lvs. stiff, linear-spatulate, to ½ in. long, ciliate: fls. white, ½ in. across. Eu.

rotundifolia. To 2 ft.: lvs. in rosettes, kidney-shaped, to 2 in. across, coarsely toothed, on petioles much longer than lvs.: fls. white spotted with red or purple, to ¾ in. across. Eu., Asia.

sancta. To 2 in., tufted: lvs. stiff, lanceolate, ⅓ in. long, the margins ciliate and cartilaginous: fls. orange-yellow, ⅓ in. across. Medit. region.

sarmentosa (*Sekika sarmentosa*). STRAWBERRY-GERANIUM. To 2 ft., with filiform stolons resembling the strawberry: lvs. orbicular-cordate, to 4 in. across, coarsely toothed, on long petioles, reddish below, veined with white above: fls. white, to 1 in. across, 2 petals much longer than others. E. Asia.—A favorite basket and vase plant.

Schottii. Hybrid between *S. corymbosa* and *S. Stribnyi*: to 3 in.

sponhemica: *S. hypnoides.*

squarrosa. To 3 in., densely tufted: lvs. linear or linear-lanceolate, ⅛ in. long, with narrow cartilaginous margin: fls. white, to ⅓ in. long. Mts., Eu.

Stabiana: *S. Aizoon* var.

stellaris. To 6 in.: lvs. obovate, to 2 in. long, toothed: fls. white, star-like, to ⅓ in. across. Eu., Asia, N. Amer.

Sternbergii (*S. hibernica*). Lvs. 3–5-parted, ciliate: fls. creamy-white. Ireland.

Stracheyi: *Bergenia Stracheyi.*

Stribrnyi. To 5 in., tufted: lvs. oblong-spatulate, to 1 in. long, with margins cartilaginous: fls. purple, ⅓ in. across, nodding. Cent. Eu.

Stuartii. Hybrid with *S. Stribnyi* as one parent: to 4 in.: fls. pale yellow or purple, ⅓ in. across.

tellimoides: *Boykinia tellimoides.*

tenella. To 4 in., tufted: lvs. linear-subulate, to ½ in. long: fls. white or yellowish, very small. Mts., Cent. Eu.

thessalica: a form of *S. porophylla* with very narrow lvs.

tirolensis. Hybrid between *S. cæsia* and *S. squarrosa*: to 3½ in.: fls. white.

Tolmiei. To 5 in.: lvs. linear, ⅓ in. long, imbricated on the short sts.: fls. white, very small. B. C. to Calif.

tombeanensis. To 2 in.: lvs. ovate- to linear-lanceolate, 3-angled, ⅛ in. long: fls. white, ½ in. long. Alps, S. Eu.

trifurcata. To 8 in.: lvs. kidney-shaped, to ¾ in. across, palmately 3-parted, the segms. toothed or lobed, on very long petioles: fls. milk-white, to ¾ in. across. Pyrenees. Var. **ceratophylla** (*S. ceratophylla*) has more deeply divided glaucous lvs.

umbrosa. LONDON PRIDE. To 1 ft.: lvs. thick, ovate to oblong, to 2½ in. long, the margins cartilaginous, often reddish beneath, petioled: fls. white or pink, to ⅓ in. across. Eu. Var. **primuloides** (*S. primuloides*). To 6 in.: lvs. primrose-like: fls. rose-pink.

virginiensis (*Micranthes virginiensis*). To 1 ft.: lvs. in rosettes, ovate to oblong, to 3 in. long, toothed: fls. white, about ⅓ in. across. N. B. to Ga. and Tenn.

Wallacei: *S. Camposii.*

Wildiana. Hybrid between *S. Aizoon* and *S. Geum:* to 8 in.: fls. white, to ⅓ in. across.

SAXIFRAGACEÆ. Saxifrage Family. A widely distributed family mostly of temp. regions, of various character and habit; 75–80 genera of herbs, shrubs and trees, having usually bisexual regular fls. with 4–5 sepals and petals, 4–10 stamens, 2–5 carpels, and fr. a caps. or berry; differs from Rosaceæ in technical characters. Several genera are grown for ornament and the currant and gooseberry for the edible frs.; genera herein treated are Abrophyllum, Astilbe, Bauera, Bergenia, Boykinia, Cardiandra, Carpenteria, Carpodetus, Chrysosplenium, Decumaria, Deutzia, Escallonia, Francoa, Heuchera, Hydrangea, Itea, Jamesia, Kirengeshoma, Lithofragma, Mitella, Parnassia, Peltiphyllum, Philadelphus, Quintinia, Ribes, Rodgersia, Saxifraga, Schizophragma, Tellima, Tiarella, Tolmiea.

SAXIFRAGE: *Saxifraga.* **Golden:** *Chrysosplenium.*

SCABIOSA. Scabious. Mourning Bride. Pincushion-Flower. *Dipsaceæ.* Ann. or per. and perhaps bien. herbs with opposite entire or divided lvs. and 4–5-lobed fls. in terminal long-stalked composite-like showy heads subtended by herbaceous involucral bracts, the calyx bristly; Old World.

Scabiosas are popular flower-garden subjects and thrive in any good soil and sunny exposure. Propagated by seeds, and perennials also by division.

africana. Lvs. obovate, irregularly toothed, to 6 in. long and 2 in. wide, upper lvs. undivided or pinnatifid, soft-tomentose. S. Afr.

amœna. Per. to 3 ft.: lvs. lyrate-pinnatifid: fls. pale blue or lilac, in globose heads. W. Asia.

atropurpurea. Sweet Scabious. Erect ann. (or grown as such) to 3 ft. and more, cult. in many forms: basal lvs. lyrate-pinnatifid, st.-lvs. pinnate into oblong toothed lobes: fls. dark purple, rose or white, in ovate or oblong heads to 2 in. across. S. Eu. Some of the hort. vars. are: **candidissima,** fls. white and often double; **compacta,** of compact habit; **flore-pleno,** fls. double; **grandiflora** (var. *maxima*), fls. large; **major,** tall; **nana** (var. *minor*), smaller, much branched; **pumila,** dwarf.

caucasica. Per. to 2½ ft.: basal lvs. lanceolate-linear, entire, st.-lvs. divided: fls. light blue, in flattish heads to 3 in. across, the involucre gray-tomentose. Caucasus. Var. **alba** has white fls. Var. **goldingensis** has large deep lavender fls. Var. **magnifica** has large lavender-blue fls.

Columbaria. Per. to 2 ft.: basal lvs. ovate, toothed, st.-lvs. pinnately cut into linear segms.: fls. blue, in ovate heads to 1½ in. across. Eu., Asia, Afr.

gigantea: listed name of doubtful application.

graminifolia. Per. to 1 ft.: lvs. linear, entire, silvery: fls. pale blue, in flattish heads to 1½ in. across. Eu.

japonica. Per. to 2 ft.: lvs. pinnately divided into narrow segms.: fls. violet-blue, in heads to 2 in. across. Japan.

lyrata: doubtful name.

ochroleuca. Per. to 1½ ft.: basal lvs. lyrate-pinnatifid, st.-lvs. 1–2-pinnate into oblong or linear segms., whitish-pubescent: fls. yellow. Eu., Asia.

pterocephala: *Pterocephalus Parnassi.*

pyrenaica. Per. to 1½ ft., white-tomentose: basal lvs. oval-lanceolate, toothed, st.-lvs. pinnately divided: fls. blue-lilac. S. Eu.

stellata. Ann. to 1½ ft.: basal lvs. toothed, st.-lvs. pinnately divided: fls. blue, in globose heads 1 in. across. S. Eu.

Succisa: *Succisa pratensis.*

vestita: synonym of *S. pyrenaica.*

SCABIOUS: *Scabiosa.* **Shepherds-:** *Jasione.*

SCABROUS: rough; feeling roughish or gritty to the touch.

SCALE: a name given to many kinds of small mostly dry and appressed leaves or bracts; a vestige.

SCAPE: leafless peduncle arising from the ground; it may bear scales or bracts but no developed foliage leaves and may be one- or many-flowered. Tulips are borne on scapes.

SCARIOUS: leaf-like parts or bracts that are not green, but thin, dry, and membranaceous, often more or less translucent.

SCARLET-BUSH: *Hamelia erecta.* **Lightning:** *Lychnis chalcedonica.* **Plume:** *Euphorbia fulgens.* **Runner:** *Phaseolus coccineus.*

SCELETIUM. *Aizoaceæ.* S. African per. separated from Mesembryanthemum (which see for cult.), the lvs. several times broader than thick and naturally withering to a skeleton. **S. tortuosum** (*M. tortuosum*). Branches long and procumbent, leafy at top: lvs. ovate-lanceolate, somewhat recurved, tapering to both ends, about 1 in. long: fls. white, large. —The plants of this genus are poisonous.

SCHAUERIA. *Acanthaceæ.* Trop. herbs or shrubs with opposite entire lvs. and tubular 2-lipped yellow or red fls. in terminal spikes, the calyx-lobes and bracts very long and narrow and giving a shaggy appearance to the fl.-cluster; one species grown in the greenhouse. Propagated by cuttings.

flavicoma. To 4 ft.: lvs. ovate or ovate-lanceolate, to 6 in. long, shining: fls. pale yellow, 1½ in. long. Brazil.

SCHEELEA. *Palmaceæ.* Heavy feather-lvd. palms of trop. Amer., probably not in cult. within our limits; see note under *Attalea.*

SCHEFFLERA. *Araliaceæ.* Trop. shrubs or small trees with compound lvs. and polygamous or diœcious fls. borne in umbels, heads or racemes; for outdoor cult. in S. U. S.

digitata. Tree to 25 ft.: lvs. digitately compound into 7–10 oblong toothed lfts. to 7 in. long: fls. greenish, to ⅓ in. across, in panicles to 1 ft. long. New Zeal.

SCHIMA. *Theaceæ.* Evergreen trees or shrubs native in trop. Asia, with alternate simple lvs., showy fls., and fr. a woody caps.; one species grown in S. Calif.

Wallichii. Tree to 100 ft.: lvs. elliptic-oblong, to 7 in. long, nearly entire: fls. white, fragrant, to 2 in. across, in short terminal racemes: fr. ¾ in. across. India to Sumatra.

SCHINUS. *Anacardiaceæ.* Diœcious trees with simple or compound lvs., small fls. in racemes or panicles, 10 stamens, and round 1-seeded drupaceous fr.; native mostly in S. Amer., a few grown in subtrop. regions, and in greenhouses N. Planted as lawn and avenue trees, but *S. Molle* is subject to black scale and is sometimes a menace. Propagated by seeds or cuttings.

dependens. Shrub or small tree to 15 ft.: lvs. simple, oblong, usually entire: fls. yellow, in short axillary racemes: fr. deep purple. W. S. Amer.

latifolius. Lvs. simple, to 3 in. long and 1 in. wide: fls. white, in short racemes. Chile.

lentiscifolius. Shrub to 3 ft.: lvs. of 4–6 pairs of oval or lanceolate nearly entire lfts.: fls. white, in loose panicles to 3 in. long: fr. pink or whitish. Brazil.

Molle. California Pepper-Tree. Peruvian Mastic-Tree. Evergreen tree to 20 ft., with graceful hanging branches: lvs. of many linear-lanceolate entire or toothed lfts.: fls. yellowish-white, in much branched terminal panicles: fr. rose-color. American tropics.

terebinthifolius. Brazilian Pepper-Tree. Christmas-Berry-Tree. Tree to 20 ft., of more rigid habit than *S. Molle:* lvs. usually of 7 oblong lfts. very dark green above and lighter below: fr. bright red. Brazil.

SCHISANDRA (commonly but not originally spelled *Schizandra*). *Magnoliaceæ.* Twining shrubs native in Asia and 1 in N. Amer., with simple lvs., unisexual red or white fls. in axillary clusters, and mostly red berry-like frs. in drooping racemes.

Both sexes should be planted if the decorative fruit is desired. *S. chinensis* is hardy North. Propagated by seeds, cuttings of green wood under glass, root-cuttings, layers and suckers.

chinensis. Climbing to 25 ft.: lvs. obovate, to 4 in. long, toothed, shining above: fls. white or pinkish, ½ in. across, fragrant, May–June: berries scarlet. N. E. Asia, Japan.

SCHISMATOGLOTTIS. *Araceæ.* Herbs native in the Malay Archipelago, having lanceolate, cordate or arrow-shaped lvs. usually variegated, and unisexual fls. borne on spadices shorter than the cylindrical spathes; grown in greenhouses where a temperature of 70° should be maintained throughout the winter. For cult., see *Dieffenbachia.*

asperata. Lvs. ovate or obovate, to 5 in. long and 3 in. wide, deep green minutely white-dotted above, pale and black-dotted beneath, the petioles about length of blades. Borneo. Var. **albo-maculata** (*S. crispata*) has lvs. silvery above except the margins and nerves.

crispata: *S. asperata* var. *albo-maculata.*

decora: *S. pulchra.*

marantæfolium var. **maculatum:** *Aglaonema commutatum.*

neo-guineensis (*S. novo-guineensis. Colocasia neo-guineensis*). Lvs. ovate-cordate, to 10 in. long and 6 in. wide, bright green irregularly spotted with yellowish-green, the petioles twice longer than the blades: spathes about 3 in. long with green tube and white limb. New Guinea.

picta. Lvs. ovate- or oblong-cordate, to 8 in. long and 5 in. wide, pale green marked with white dots on either side of midrib, the petioles 1 ft. long: spathes about 2½ in. long, greenish-yellow. Java.

pulchra (*S. decora*). Lvs. cordate-ovate, 5 in. long and 2½ in. wide, irregularly variegated with silvery-white, the petioles to 6 in. long: spathes 3 in. long, pale green. Borneo.

Roebelinii: an unidentified trade name; possibly *Aglaonema Robelinii.*

siamensis: an unidentified trade name; perhaps *Aglaonema siamense.*

SCHIVERECKIA. *Cruciferæ.* Two Eurasian little perennials like Alyssum and Draba, differing in technical characters; one species is sometimes grown in rock-gardens. S. **podolica** (*Alyssum podolicum*) is 2–4 in. high, grayish, tufted: lvs. narrow-oblong to oblanceolate, ½ in. or less long: fls. white, in short racemes. S. E. Eu., Asia Minor.

SCHIZÆA. *Schizæaceæ.* Small mostly trop. ferns with thread-like simple or divided lvs., the sori borne in rows along the segms. of fertile lvs. which form terminal spikes. See *Ferns.*

pusilla. Curly-grass-Fern. Sterile lvs. linear and grass-like, exceeded by the fertile lvs. or stalks which are 3–5 in. long and terminated by a close pinnate fertile portion. Coast, Newf. to N. J., well known in pine barrens.—Sometimes planted: it looks more like a little grass than a fern.

SCHIZÆACEÆ. Schizæa-Fern Family. About 4 genera of mainly trop. ferns, often climbing, with simple or pinnate lvs. and sori in rows on specialized segms. which may be spike-like. Lygodium is grown in greenhouses and Schizæa may be planted in the open.

SCHIZANDRA: *Schisandra.*

SCHIZANTHUS. Butterfly-Flower. *Solanaceæ.* Erect annuals or biennials grown in the garden and greenhouse for the showy profuse bloom and dainty much-cut foliage: fls. variously colored, in terminal cymes or panicles, the corolla-tube long or short, the limb spreading, irregular and deeply cut: native to Chile.

These plants are of easy cultivation. Seed sown indoors in fall produces flowering plants in early spring or late winter. Sown in the garden in spring for summer and autumn bloom.

gracilis. Similar to *S. pinnatus* but with smaller fls. having shorter upper lip and much narrower lateral lobes.

Grahami. To 5 ft.: fls. typically lilac or rose, middle segm. of upper lip yellow or orange, not notched, corolla-tube as long as calyx, stamens slightly exserted.

grandiflorus: *S. pinnatus.*

papilionaceus: *S. pinnatus.*

pinnatus (*S. grandiflorus. S. papilionaceus*). To 4 ft. or more: fls. to 1¼ in. across, the color and markings varying greatly, lower lip usually lilac or violet, the upper paler, its middle segm. with a yellow blotch near the base and spotted with purple or violet, corolla-tube shorter than calyx, stamens prominently exserted. Color vars. are **candidissimus, carmineus, lilacinus.**

retusus. To 2½ ft.: fls. to 1¾ in. across, the large middle segm. of upper lip mostly orange and notched, corolla-tube as long as calyx, stamens slightly exserted. Var. **albus** has white fls. with middle segm. of upper lip yellowish. Var. **trimaculatus** has purplish-red fls. with 3 golden-yellow purple-bordered spots.

venustus: hort. name.

wisetonensis. Hybrid between *S. pinnatus* and *S. Grahami:* intermediate between the parents: fls. from white through bluish and pink to carmine-brown, middle segm. of upper lip mostly suffused with yellow, corolla-tube shorter than calyx, stamens slightly exserted.

SCHIZOBASOPSIS. *Liliaceæ.* A S. African bulb grown as a curiosity in greenhouses. S. **volubilis** (*Bowiea volubilis*). Bulb 5 in. thick, sending up a twining green st. which is much branched below and performs the function of the absent lvs.: fls. small, green or greenish-white, the perianth-segms, distinct.—Plants should be kept dormant from May to early Oct., at which time the bulbs should be repotted and kept well watered. Propagated by seeds or sometimes by division of the bulbs.

SCHIZOCENTRON. *Melastomaceæ.* One Mexican creeping herb sometimes grown in greenhouses and baskets. S. **elegans** (*Heeria* and *Heterocentron elegans*). Forming a dense mat: lvs. ovate, to ½ in. long: fls. purple, 1 in. across, solitary.—Propagated by cuttings.

SCHIZOCODON. *Diapensiaceæ.* A few evergreen per. herbs native in Japan, allied to Shortia, having basal lvs., nodding bell-shaped fringed fls., and capsular frs.; grown in rock-gardens.

soldanelloides. Fringed Galax. Fringe-Bell. Alpine, to few in. high: lvs. round, coarsely toothed: fls. deep rose, white or blush toward edge, the corolla-lobes fringed, 1 in. across, 4–6 on a scape.

SCHIZOLOBIUM. *Leguminosæ.* Two tall trees native in Brazil and Panama, one cult. in warm regions. S. parahybum (*S. excelsum*) has bipinnate fern-like lvs. white beneath, yellow fls. in large erect racemes, and flattened 1-seeded pods. Brazil.

SCHIZONOTUS: *Holodiscus, Sorbaria.*

SCHIZOPETALON. *Cruciferæ.* One little ann. from Chile, S. Walkeri, is sometimes grown in the flower-garden or in frames or a cool house for its attractive white fragrant fringed fls. Seeds sown in the open in early May produce flowering plants late in June and through the summer. Sometimes seeds are sown in autumn and the plants carried over cool under glass, for bloom in early spring. The plant grows 9 in. to 1 ft. or more high, erect, bearing the fls. in a terminal upright raceme.

SCHIZOPHRAGMA. *Saxifragaceæ.* Shrubs climbing by aerial rootlets, differing from Hydrangea in the marginal sterile fls. which comprise only 1 long-stalked unlobed sepal; the loose terminal clusters of white fls. are showy: lvs. bright green, opposite, long-petioled.

Like *Hydrangea petiolaris* (with which it is sometimes confused) the young plants produce small leaves and little growth if unsupported and allowed to trail over the ground. Propagation is by seeds, greenwood cuttings under glass, and by layers.

hydrangeoides. Japanese Hydrangea-Vine. Climbing to 30 ft.: lvs. deciduous, broad-ovate to nearly orbicular, to 4 in. across, toothed, pale beneath: cymes to 9 in. across; marginal calyx-lobe white, ovate, to 1½ in. long. Japan; hardy N.

integrifolium. Climbing to 12 ft.: lvs. deciduous, ovate, to 3 in. long, nearly or quite entire: cymes 10 in. across; marginal calyx-lobe ovate, 1½ in. long. China; not hardy N. In var. **molle** the lvs. are densely hairy beneath.

SCHIZOSTYLIS. Crimson Flag. Kafir-Lily. *Iridaceæ.* S. African herbs with fleshy roots, not bulbous or cormous, narrow lvs., and red fls. borne in spathes, the tube slender. Grown in the greenhouse for winter bloom and for cut-fls. Propagated by division of roots.

coccinea. To 2 ft.: lvs. to 1½ ft. long, grass-like: fls. 2 in. across, deep crimson, tube straight and 1 in. or more long.

SCHLUMBERGERA. *Cactaceæ.* Two Brazilian cacti much like Zygocactus but the fl. regular or essentially so and nearly rotate rather than elongated: sts. much branched, joints short and mostly flattened and crenate or serrate: fls. purple to scarlet, with very short tube and stamens in 2 clusters: fr. angled rather than terete. Cult. as for Zygocactus. See *Cacti.*

Gaertneri (*Epiphyllum Makoyanum*). Easter Cactus. Habit more or less upright with drooping branches, joints oblong to obovate and crenate, about 1½ in. long, with 6–12 bristles from the areoles: fls. scarlet, to 3 in. long.

Russelliana (*Epiphyllum Russellianum*). Branches drooping, joints 1½ in. or less long, with few very short bristles: fls. purplish, 2 in. or less long.

SCHMALTZIA: *Rhus.*

SCHOLAR-TREE, CHINESE: *Sophora japonica.*

SCHOMBURGKIA. *Orchidaceæ.* Epiphytes native in trop. Amer., with pseudobulbs bearing 2–3 lvs. and fls. in terminal racemes or panicles, the petals smaller than sepals and wavy, the lip 3-lobed and united with the base of the column. Cult. much as for Cattleya. See *Orchids* for cult.

crispa. Pseudobulbs with 2 leathery lvs. to 10 in. long: fls. 1½ in. across, in many-fld. racemes to 2 ft. high; sepals and petals light brown edged with yellow, wavy; lip whitish tinged with rose and edged with yellow, Oct.–Dec. Guiana.

tibicinis. Pseudobulbs with 2–3 lvs. to 6 in. long: fls. violet-brown, the lip veined with darker color and with yellow center, 3½ in. across, in 10–15-fld. racemes to 14 in. high, May–June. Mex., Panama, Venezuela.

undulata. Pseudobulbs with 2 lvs. to 10 in. long: fls. in dense racemes; sepals and petals brown, very wavy; lip light rose or white, May–July. Colombia.

SCHOTIA. *Leguminosæ.* African shrubs or small trees with pinnate lvs., red fls. in short panicles, and flattened leathery pods; grown in the greenhouse or in the open in warm regions.

brachypetala. Small tree: lfts. 8–10: fls. crimson, stalked, the petals very small. S. Afr.

latifolia. Tree to 30 ft.: lfts. 4–8: fls. rose or pink, nearly sessile. S. Afr.

speciosa. Tree to 10 ft.: lfts. 8–32: fls. crimson, stalked. S. Afr.

SCHRANKIA (*Morongia*). *Leguminosæ.* Per. herbs or shrubs mostly with prostrate prickly sts., of Amer. and Afr.: lvs. 2-pinnate, sensitive: fls. pink or purple, small, in heads or spikes: pods linear, spiny. One of them is sometimes planted far S.

Roemeriana. Sts. to 4 ft. long: lfts. ⅛ in. long: fls. pink: pods 1½ in. long. S. Tex.

SCIADOPITYS. *Pinaceæ.* One slow-growing Japanese evergreen tree, of ornamental value, **S. verticillata.** Umbrella-Pine. Lvs. of two kinds, small and scale-like, and the conspicuous ones in whorls of 15–35, linear, to 6 in. long, glossy above, with 2 white bands below, furrowed: cones to 5 in. long, with woody scales. Hardy in S. New England. For cult. see *Conifers.*

SCILLA. Squill. *Liliaceæ.* Old World bulbous herbs with narrow basal lvs. and blue, purple or white fls. in racemes terminating the scape, the perianth-segms. distinct or nearly so; planted for the early spring bloom of most species.

Squills are of easy culture out-of-doors if left undisturbed for a number of years, with an occasional top-dressing. They may also be grown in pots in a cool greenhouse. Propagated by offsets planted early in autumn. The usual kinds are hardy and early spring flowering.

amœna. Star-Hyacinth. To 6 in.: lvs. to ¾ in. across: fls. blue to whitish, wheel-shaped, to ¾ in. across, in 4–6-fld. racemes. Germany, N. Italy.

autumnalis. To 6 in.: lvs. partially terete: fls. rose, wheel-shaped, ½ in. across, in open racemes. Eu., N. Afr.—Blooms in autumn.

bifolia. To 1 ft.: lvs. to ½ in. across: fls. blue with white and reddish vars., wheel- or star-shaped, ½ in. across, mostly nodding, in 3–12-fld. racemes. Eu., S. W. Asia.

campanulata: *S. hispanica.*

hispanica (*S. campanulata*). SPANISH BLUEBELL. To 20 in.: lvs. to 1 in. across: fls. blue to rose-purple, campanulate, 1 in. across, often nodding, in 12- or more-fld. racemes. Spain, Portugal. Vars. alba and albo-major have white fls.

hyacinthoides. HYACINTH S. To 3 ft.: lvs. to 1¼ in. across: fls. violet-blue, campanulate, ¾ in. across, in many-fld. racemes. Medit. region.

nonscripta (*S. nutans*). ENGLISH BLUEBELL. To 1 ft.: lvs. ½ in. across: fls. blue, cylindrical or tubular, ½ in. across, in 6–12-fld. racemes. Eu. Var. alba has white fls., cærulea blue, rosea rose or pink, rubra reddish.

nutans: *S. nonscripta.*

peruviana. To 1 ft.: lvs. to 1 in. across: fls. purple to reddish or white (var. alba), wheel-shaped, ½ in. long, in 50- or more-fld. short racemes. Medit. region, the specific name being a misnomer.

sibirica. To 6 in.: lvs. to ¾ in. across: fls. deep blue, ½ in. across, wheel-shaped, in about 3–fld. racemes, often nodding. Russia, S. W. Asia.

verna. To 6 in.: lvs. about ⅛ in. across: fls. blue, ½ in. across, fragrant, in corymb-like racemes. W. Eu.

SCINDAPSUS. IVY-ARUM. *Araceæ.* Malayan herbs climbing by rootlets, with simple usually variegated lvs., broad sheathing petioles, and bisexual fls. on densely-fld. spadices slightly shorter than the boat-shaped spathes; cult. in the greenhouse, the same as *Philodendron.*

argyræus: *S. pictus* var.

aureus (*Pothos aureus*). Tall climber: lvs. ovate or ovate-oblong, to 1½ ft. long and 14 in. wide, entire or margins lobed, blotched with pale yellow. Solomon Isls.

pictus. Climbing to 40 ft.: lvs. obliquely ovate-oblong, to 6 in. long and 3 in. wide, spotted dark green above: spathes about 3 in. long, white. E. Indies. Var. argyræus (*Pothos argyræus*) has deeply cordate lvs. spotted with silvery-white above.

SCIRPUS. BULRUSH. *Cyperaceæ.* Grass-like herbs with bisexual fls. in spikelets that are solitary or in spikes or umbels; about 150 widely distributed species. Grown in shallow water or damp places and *S. cernuus* in the greenhouse. Propagated by seeds, division and suckers.

acutus (*S. occidentalis*). To 9 ft., the lvs. mostly reduced to basal sheaths: spikelets in clusters of 2–7 or solitary. N. Amer.

atrovirens. To 4 ft., with leafy sts.: lvs. to ½ in. wide: spikelets in dense heads. N. S. to Ga. and La.

cernuus (*Isolepis gracilis*). Tufted, with thread-like sts. to 1 ft. which become drooping, almost leafless: spikelets solitary. Eu., but widely nat.

Holoschœnus. To 4 ft., with 1 or 2 stiff narrow basal lvs.: spikelets in dense heads. Eu., Asia.

lacustris. To 9 ft., often much less, lvs. reduced to basal sheaths: spikelets in head-like clusters. Eu., Asia. — Differs from its American representative, *S. validus* and also from *S. Tabernæmontani* in the 3-cleft style.

microcarpus. To 5 ft. or the lvs. sometimes longer: spikelets in head-like clusters. N. Amer.

occidentalis: *S. acutus.*

Tabernæmontani. To 2 ft. and more, the lvs. reduced to 1 or 2 sheaths: spikelets in terminal cymes, the styles 2. Eu. Var. zebrinus has sts. banded with white.

SCLEROCACTUS. *Cactaceæ.* Two spiny species of S. W. U. S. much like Echinocactus and Ferocactus, but the fr. is nearly naked and the thin scattered scales bear small tufts of wool in their axils: usually simple but sometimes clustered, some of the central spines hooked: fls. somewhat bell-shaped, borne on young areoles above the spine-cluster. Cult. as for Echinocactus. See *Cacti.*

Whipplei (*Echinocactus* and *Ferocactus Whipplei*). Body or branches globose and about 3 in. diam., or oblong and to 6 in. long, ribs 13–15, radial spines 7–11, central usually 4: fls. purplish or lavender, to 1½ in. long. Colo., Utah, N. Ariz., on high mesas.

SCLEROPOA. *Gramineæ.* Low tufted ann. grasses of the Medit. region, with narrow lvs. and flattened spikelets in panicles; one species sometimes planted for ornament. See *Grasses.*

rigida (*Festuca rigida*). To 1½ ft.: lvs. to 4 in. long and 1/12 in. wide: panicles to 3½ in. long, with short spreading or ascending branches. S. Eu.; nat. in S. U. S. and Bermuda.

SCOKE: *Phytolacca americana.*

SCOLOPENDRIUM VULGARE: *Phyllitis Scolopendrium.*

SCOLYMUS. *Compositæ.* Erect or wide-branching thistle-like ann. and per. herbs with pinnately spiny-toothed or lobed alternate lvs. and yellow ligulate fls. in sessile heads; pappus a ring or few bristles; native of the Medit. region.

The Spanish oyster-plant is grown for its edible tap-root. It requires practically the same culture as parsnips and salsify. It is milder in flavor than the root of the true oyster-plant.

hispanicus. GOLDEN THISTLE. SPANISH OYSTER-PLANT. Bien., much branched, to 2½ ft.: lvs. pinnately cut: heads few-fld., about 1 in. long. S. Eu.

SCORPIOID: said of a coiled cluster in which the flowers are two-ranked and borne alternately at the right and the left; common in Boraginaceæ.

SCORPIURUS. *Leguminosæ.* Decumbent or nearly stemless herbs with simple lvs., nodding mostly yellow papilionaceous fls. solitary or few in the axils, and variously coiled pods which are grown as curiosities and surprises under the name "worms." Propagated by seeds sown where plants are to stand.

muricata. Fls. 3–4 on stalks longer than lvs.: pods linear, loosely coiled near end, bristly. Medit. region.

subvillosa. Fls. 1–4 on stalks longer than lvs., standard sometimes reddish: pods linear, tightly coiled, bristly. Medit. region.

sulcata. Fls. 1–2 on stalks longer than lvs.: pods linear, flatly coiled, rough. Medit. region.

vermiculata. Fls. solitary on stalks shorter than lvs.: pods thick, rough with stalked tubercles. Medit. region.

SCORZONERA. *Compositæ.* Herbaceous perennials, rarely annuals: lvs. more or less grass-like, sometimes lobed or dissected: fls. ligulate, in long-peduncled heads; pappus plumose: natives of the Old World.

One is cultivated as a root-vegetable, the same as parsnips and salsify. It is treated as an annual or biennial. The leaves are also eaten in salads.

hispanica. BLACK SALSIFY. Per. to 3 ft., usually pubescent, the long fleshy tap-root with a black skin: lvs. oblong to linear, undulate: heads to 2 in. long, yellow. Eu.

SCREW-PINE: *Pandanus.*

SCROPHULARIA. Figwort. *Scrophulariaceæ.* Many erect commonly per. herbs in the northern hemisphere, strong-smelling, with mostly opposite broad serrate to dentate lvs., and small unshowy greenish, purple or yellow fls. in terminal cymes, the corolla tubular and irregularly 5-lobed, sterile stamen manifest; rarely planted in the flower-border or for medicinal purposes.

aquatica. To 4 ft., glabrous, sts. 4-winged: lvs. ovate-oblong, obtuse, cordate at base: fls. dull purple, in panicles to 2 ft. long. Wet places, Eu., W. Asia.

lanceolata (*S. leporella. S. occidentalis*). To 8 ft., sts. mostly puberulent and lacking grooved sides, blooming in early summer: lvs. lanceolate to ovate, rather short-stalked, truncate at base, very sharp-serrate: fls. green or purple, shining outside. Vt. to Ore., Va. and Okla.

lateriflora. To several ft., glaucous and glabrous: lvs. lanceolate-cordate, to 5 in. long, toothed: fls. about 1/12 in. long. Caucasus.

leporella: *S. lanceolata.*

marilandica. To 10 ft., st. glabrous and with grooved or sunken sides, blooming midsummer or later: lvs. ovate to ovate-lanceolate, cordate or rounded at base, to 5 in. or more long, slender-petioled: fls. dull greenish-purple outside, ⅓ in. long. Me. to Ga. and Tenn.

nodosa. Similar to *S. marilandica* but only to 3 ft. high, with smaller lvs. which are often cordate and double-toothed. Eu., N. Asia.

occidentalis: *S. lanceolata.*

peregrina. Ann. to 2 ft.: lvs. cordate-ovate, toothed: fls. dark reddish-purple. Medit. region.

vernalis. To 2 ft., usually bien.: lvs. cordate-ovate, hairy, double-toothed: fls. greenish-yellow. Eu.

SCROPHULARIACEÆ. Figwort Family. About 180 genera of herbs, shrubs and trees, trop. and temp. regions in eastern and western hemispheres, having usually irregular bisexual fls. with 4–5-toothed or -parted calyx, gamopetalous 4–5-lobed corolla which is often personate, commonly 4 but sometimes 2 or 5 stamens, superior 2-celled ovary and fr. a caps. or berry. Plants of many genera are grown for ornament and some for medicinal purposes, as Allophyton, Alonsoa, Angelonia, Antirrhinum, Aureolaria, Bowkeria, Calceolaria, Castilleja, Celsia, Chænostoma, Chelone, Chionophila, Collinsia, Cymbalaria, Diascia, Digitalis, Erinus, Galvesia, Gratiola, Hebe, Hebenstretia, Isoplexis, Jovellana, Kickxia, Leucophyllum, Linaria, Manulea, Maurandia, Mazus, Mimulus, Nemesia, Orthocarpus, Ourisia, Paulownia, Pedicularis, Penstemon, Phygelius, Rehmannia, Rhinanthus, Rhodochiton, Russelia, Scrophularia, Sibthorpia, Synthyris, Torenia, Verbascum, Veronica, Veronicastrum, Wulfenia, Zaluzianskya.

SCURVY-GRASS: *Cochlearia.*

SCUTELLARIA. Skullcap. *Labiatæ.* Herbaceous annuals and perennials, rarely subshrubs, with blue, violet, scarlet or yellow 2-lipped fls. in pairs in the axils or in terminal spikes or racemes; widely distributed.

Scutellarias are sometimes grown in borders and rock-gardens and *S. Ventenatii* under glass. The herbaceous types are propagated by seeds and division; the shrubby kinds in spring by cuttings of half-ripened wood.

albida. Pubescent: lvs. broad-ovate, 1½ in. long, toothed, petioled: fls. opposite, whitish or dull, ½ in. long, in racemes 1 ft. or more long. S. E. Eu., Cent. Asia.

alpina. Spreading per. to 10 in.: lvs. ovate, to 1 in. long, slightly toothed, short-petioled or nearly sessile: fls. purple and white or somewhat yellowish, 1 in. long, in dense terminal racemes. Eu. Var. **lupulina** (*S. lupulina bicolor*), fls. yellow. Other color forms are vars. **alba, cærulea, rosea.**

altissima. Per. to 3 ft.: lvs. cordate-ovate, 3 in. long, coarsely toothed, petioled: fls. opposite, creamy-yellow, ½ in. long, in long one-sided racemes. S. E. Eu., Caucasus.

baicalensis. Half-erect per. to 1 ft.: lvs. lanceolate, entire, nearly sessile: fls. blue, in racemes. E. Asia. Var. **cœlestina** has large spikes of bright blue fls. 1 in. long.

coccinea. Shrub or subshrub: lvs. oblong, to 1 in. long, nearly entire, petioled, violet-purple beneath: fls. scarlet, to ¾ in. long, in terminal spikes 1½ in. long. S. Amer.

Columnæ. To 3 ft.: lvs. ovate, 2 in. long, wavy-toothed, petioled: fls. dark purple, to 1 in. long, in racemes 6 in. or more long. S. Eu.

integrifolia. Pubescent per. to 2½ ft.: lvs. linear to oblong, to 2 in. long, entire, petioled or upper sessile: fls. blue or whitish, in terminal racemes. Mass. to Fla. and Tex.

lupulina: *S. alpina* var.

Mociniana. Tender shrubby plant to 1 ft.: lvs. ovate, 1 in. long, wavy: fls. red with yellow throat, 1½ in. long, in dense terminal spikes. Mex.

orientalis. Procumbent per.: lvs. ovate, ¾ in. long, deeply toothed or nearly pinnatifid, long-petioled, white-tomentose beneath: fls. purplish or yellow, 1 in. long, in spike-like racemes to 3 in. long. S. E. Eu., Asia.

resinosa. Per. to 1 ft., gray-pubescent: lvs. ovate or oval, ½ in. long: fls. blue or purplish, ½ in. long. Colo. to Ariz.

tuberosa. Per. to 5 in., the rootstocks tuberous: lvs. ovate, ½ in. or less long, petioled, toothed, purplish beneath: fls. violet-purple, ¾ in. long. Calif., Ore.

Ventenatii. Per., erect: lvs. cordate-ovate, sinuate-dentate: fls. scarlet, about 1 in. long, in elongating terminal racemes. Colombia.

SCUTICARIA. *Orchidaceæ.* Two S. American epiphytes with cylindrical whip-like lvs., rudimentary pseudobulbs, and solitary fls., the sepals and petals similar, the lip concave. For cult. see *Orchids.*

Hadwenii. Lvs. to 16 in. long: fls. on stalks to 4 in. long; sepals and petals yellowish-green spotted with brown; lip entire, white spotted with violet, May, Sept. Brazil.

Steelii. Lvs. to 30 in. long: fls. on stalks to 2 in. long; sepals and petals yellow spotted with brown; lip 4-lobed, white spotted with violet, Aug.–Sept. Guiana.

SCYTHIAN LAMB: *Cibotium Barometz.*

SEAFORTHIA: *Ptychosperma elegans;* but the palm commonly planted as *Seaforthia elegans* is *Archontophœnix Cunninghamiana.*

SEA-KALE (*Crambe maritima*). Heavy hardy succulent perennial herb of the coasts of western Europe, grown for the young shoots which when blanched are used as a pot-herb, like asparagus. The great thick glaucous-blue leaves are conspicuous and showy and may contribute a good element in ornamental borders.

The young spring shoots (leaf-stalks) of sea-kale are blanched by growing into loose fine earth with which the crown has been covered to the depth of a foot or more; or a light-tight box or other receptacle may be inverted over the plant. If the growth is to be cut for the kitchen until late in the season, it is well to allow a part of the plant to go naturally into leaf in order to maintain the vigor of the root; and in any case after the cutting is over, the plant should be stimulated into good growth for the remainder of the season as with asparagus and rhubarb. Sea-kale should give good yields for eight or ten years.

Sea-kale comes readily from seeds, sown in their globular seed-like pods. It is well to carry the seedlings in a bed the first year, and then to transplant to permanent quarters. The field distance is ordinarily about 3 × 3 feet. A good harvest from seedlings should be had the third year from seed. The plant is also propagated by means of root-cuttings, and a good crop may then be taken the second year. Cuttings 4 or 5 inches long are made of vigorous roots, and these cuttings are usually planted directly in the field.

SEA URCHIN: *Hakea laurina.*

SEBESTEN: *Cordia Sebestena.*

SECALE. *Gramineæ.* Ann. or per. grasses of Eu. and Asia, differing from Triticum in technical floral characters; one species a valuable cereal grain and forage plant. See *Grasses.*

cereale. RYE. Tufted ann. to 5 ft., bluish-green: lvs. to ½ in. across: spikes dense, curved, to 6 in. long, long-awned: fr. light brown, ⅓ in. long. Cultigen.

SECHIUM. *Cucurbitaceæ.* One tendril-bearing monœcious herbaceous vine with per. root, grown for its edible frs. and tubers, native in trop. Amer.: fls. small and whitish, the pistillate 1 or 2 in the axils, staminate racemose: fr. large and thick, with big seed. **S. edule** (*Chayota edulis*). CHAYOTE. CHRISTOPHINE. Tall-climbing or running: lvs. broad-ovate to triangular-ovate, to 10 in. across, angled or shallowly lobed: fr. of various shapes and sizes in the cult. vars., mostly somewhat pear-shaped and 3–4 in. long, furrowed, green or white, at the apex closed or puckered over the seed which is 1–2 in. long. See *Chayote.*

SECURIDACA. *Polygalaceæ.* Trop. American shrubs, trees or vines with alternate entire lvs., mostly pink or purplish irregular fls. in racemes or panicles, the lower petal with a fringed crest, and fr. a 1-seeded winged samara.

diversifolia (*S. erecta. Elsota diversifolia*). Trailing or climbing shrub: lvs. ovate to oblong, to 5 in. long, thick: racemes to 5½ in. long: fr. to 2¼ in. long. W. Indies, Cent. Amer. to Ecuador.

erecta: *S. diversifolia.*

tenuifolia. Lvs. oblong, pale and pubescent beneath: fls. to ½ in. long, long-stalked, in long loosely-fld. racemes. Trinidad.

SECURIGERA. *Leguminosæ.* One ann. herb from the Medit. region. **S. Coronilla** (*Coronilla Securidaca*). To 1 ft.: lvs. pinnate: fls. yellow, papilionaceous, nodding, in axillary umbels: pods flattened, to 3½ in. long, curved, the edges thickened.—Propagated by seeds sown in spring where the plants are to stand.

SEDGE: *Carex.* Family: *Cyperaceæ.*

SEDUM. STONECROP. LIVE-FOR-EVER. *Crassulaceæ.* Low succulent mostly per. more or less evergreen herbs of the north temp. zone, with white, yellow and rose, rarely red or blue fls. in terminal cymes, bearing twice as many stamens as petals. The greater number in cult. are small herbs without prominent rhizome or upright stock and they have a decumbent or trailing habit and often root at the joints. Certain of the species have erect more or less stiff sts., however, and these are usually broad-lvd.: the common run-wild live-for-ever (*S. triphyllum*) is an example.

Some of the species are grown under glass for the interesting habit and more or less showy bloom. The low hardy kinds are popular in rock-gardens and edgings. The stonecrops are of easy cultivation, even in thin poor soils. Propagated by seeds or offsets or pieces planted as cuttings.

acre. Creeping evergreen forming mats, to 5 in.: lvs. alternate, imbricated, oblong-triangular, about 3/16 in. long: fls. bright yellow, ½ in. across, in late spring and summer. Old World. Var. **album** with white fls. is listed but it is probably not of this species. In var. **aureum** the lvs. are bright yellow in spring. Var. **majus** is of large stature. Var. **minus** is a small form.

Adolphi. Bushy evergreen per.: lvs. alternate, broadly lanceolate, 1½ in. long, very fleshy: fls. white, ¾ in. across, Mar.–Apr. Mex.

Aizoon (*S. Maximowiczii. S. Laggeri*). Per. to 1½ ft. with large thick knotty rootstocks and long tuberous roots: lvs. alternate, linear- to ovate-lanceolate, to 3 in. long, sharply toothed: fls. yellow to orange, ½ in. across, in summer. Siberia to Japan.

Alberti (*Sempervivum Alberti*). Evergreen, creeping, to 2 in. high: lvs. linear-oblong, to ½ in. long: fls. white, ½ in. across, in early summer. E. Turkestan.

alboroseum (*S. japonicum*). Per. to 2 ft., with tuberous roots: lvs. mostly opposite, ovate to obovate, to 3 in. long, toothed: fls. greenish-white, ½ in. across, in early autumn. Japan, China.

album (*S. turgidum*). Creeping evergreen forming mats, to 8 in. high, variable: lvs. alternate, linear-oblong, to ½ in. long: fls. white, ⅜ in. across, in summer. Eu., Asia, N. Afr. Var. **brevifolium** has very short lvs. Var. **micranthum** has fls. half size of type. Var. **murale** has purple foliage and pinkish fls. Var, **purpureum** is listed, with purplish foliage.

altissimum. Evergreen, to 2 ft.: lvs. alternate, lanceolate, to 1½ in. long: fls. greenish-white, ½ in. across, in summer. Medit. region. Var. **latifolium** (*S. nicaeense*) is a large form.

amplexicaule. Small procumbent per. with wiry much branched sts., the barren shoots 1–3 in. long and bearing linear terete glaucous lvs. with clasping base: fls. to ¾ in. across, golden-yellow in a forked infl. S. Eu.—Allied to *S. pruinatum.*

Anacampseros. Nearly evergreen, procumbent, to 6 in. high: lvs. alternate, obovate to orbicular, to 1 in. long: fls. dull purple, ¼ in. across, in summer. S. Eu.

anglicum. Creeping evergreen, making mats, to 2 in. high: lvs. alternate, elliptic, cylindrical, to 3/16 in. long: fls. white, ½ in. across, in summer. W. Eu.

annuum. Much branched ann. to 3 in.: lvs. alternate, oblong-linear, ¼ in. long: fls. yellow, small, June–July. Eu., Asia Minor, Greenland.

anomalum. Low per., decumbent or ascending, light green and slightly pinkish: lvs. spatulate in rosettes, oblong to oblanceolate on fl.-sts. and to ⅓ in. long: fls. bright yellow, nearly sessile. S. W. Calif.

anopetalum. Creeping evergreen per., flowering shoots to 9 in.: lvs. crowded, linear, to ¾ in. long: fls. whitish, rarely yellow, in cymes to 1 in. across, June–July. Eu., Asia Minor.

arboreum: see *Crassula portulacea.*

asiaticum: *S. crassipes.*

atratum. Ann. or bien. to 2½ in.: lvs. club-shaped, cylindrical: fls. white with green or purple veins, in summer. Cent. Eu.

aureum: see *S. mexicanum.*

Borderi: *S. Telephium* var.

Braunii: name applied to *S. spurium* or *S. kamtschaticum.*

brevifolium. Creeping mealy evergreen to 2 in. high: lvs. crowded in 4 rows, ovoid, ⅛ in. long: fls. white, ¼ in. across, in summer. Medit. region. Var. **album** with bronzy lvs. is listed but probably does not belong here.

Brownii: name applied to *S. spurium* and *S. kamtschaticum.*

cæruleum. Ann. to 4 in.: lvs. alternate, ovoid to oblong, to ¾ in. long: fls. blue, white at base, ¼ in. across, in summer. Medit. region.

carneum: *S. lineare* var. *variegatum.*

carpaticum: see *S. Telephium.*

confusum. Much branched evergreen per. to 1 ft.: lvs. alternate, obovate-spatulate, to 1½ in. long: fls. yellow, to ¾ in. across, in late spring. Probably Mex.—It may be known in cult. as *S. spathulifolium.*

corsicum: *S. dasyphyllum* var. *glanduliferum.*

crassipes (*S. asiaticum*). Per. to 1 ft.: lvs. alternate, linear to lanceolate, to ¾ in. long: fls. yellowish-white to greenish, ½ in. across, in summer. Himalayas, China.

cruentum: trade name.

cupreum. Foliage narrow: fls. yellow. Name unidentifiable botanically.

dasyphyllum. Evergreen, to 2 in.: lvs. opposite, ovoid, ⅛ in. long: fls. white tinged pink, yellowish at base, ¼ in. across, in early summer. Eu., N. Afr. Var. **glanduliferum** (*S. corsicum*) is densely glandular-pubescent.

dendroideum. Evergreen per. to 2 ft.: lvs. crowded at tips of branches, spatulate-orbicular, to 1¾ in. long, rounded on one side: fls. bright yellow, ½ in. across. Mex.—*Crassula portulacea* is also sometimes known under this name.

diffusum. Per. with spreading sts. to 6 in. long: lvs. alternate, oblong, to ¼ in. long: fls. white, to ½ in. across. Mex.

divergens. Creeping evergreen, to 6 in.: lvs. opposite, obovate, ¼ in. long: fls. bright yellow, ¾ in. across, in early summer. Ore. to B. C.

Douglasii. Evergreen per., green often tinged red, st. to 12 in. high, simple: lvs. linear to linear-lanceolate, nearly terete, to ¾ in. long: fls. bright yellow, sessile, ½ in. across. Mont. to B. C. and Calif.

Ellacombianum. Smooth per. to 6 in. high, related to *S. Aizoon* but lacks the much-thickened rootstock and tuberous roots of that species, has many arching sts. and spatulate crenate-serrate lvs.: fls. yellow, ⅝ in. across in a close flat leafy umbel-like cluster. Japan.—Sometimes grown under the name *S. Selskianum.*

Ewersii. Per. to 1 ft.: lvs. opposite, broadly ovate, ¾ in. long: fls. purplish-pink, ½ in. across, in late summer. Himalayas to Mongolia.

Fabaria. Per. to 1½ ft.: lvs. alternate, lanceolate, to 3 in. long, toothed: fls. lilac-purple, about ½ in. across, in late summer. Eu.

Forsterianum: *S. rupestre* var.

frigidum: *S. rhodioloides.*

glaucum: *S. hispanicum* var. *minus.*

Greggii: see *S. moranense.*

hispanicum. Ann. or bien. to 6 in.: lvs. linear to oblong-lanceolate, to 1 in. long: fls. pinkish-white, ½ in. across, in early summer. Switzerland to Persia. Var. **minus** (*S. glaucum, S. lydium* var. *glaucum*) is a per. to 2 in. high, with glaucous-blue foliage densely crowded on the barren shoots.

hybridum. Creeping evergreen forming mats, to 6 in. high: lvs. alternate, oblong-lanceolate, 1 in. long, toothed: fls. yellow, ½ in. across, in spring and again in late summer. Siberia, Mongolia.

ibericum: *S. stoloniferum.*

japonicum: *S. alboroseum; S. japonicum macrophyllum* is the same or else *S. maximum.*

Jepsonii: probably *Gormania laxa.*

kamtschaticum. Per. to 9 in.: lvs. alternate or opposite, obovate, to 2 in. long, toothed: fls. orange-yellow, ¾ in. across, in summer. N. E. Asia.

Laggeri: *S. Aizoon.*

Liebmannianum: see *S. moranense.*

lineare. Evergreen, to 6 in. high: lvs. linear to linear-lanceolate, cylindrical, to 1 in. long: fls. yellow, star-like, ½ in. across, in summer. Japan, China. Var. **variegatum** (*S. carneum variegatum*) has lvs. margined with white.

lycopodioides: *Crassula lycopodioides.*

lydium. Evergreen, to 3 in.: lvs. crowded, linear, cylindrical, ¼ in. long: fls. white, ¼ in. across, in early summer. Asia Minor.—The form advertised as var. *glaucum* is properly *S. hispanicum* var. *minus.*

macrophyllum: a garden name applied to *S. alboroseum* and *S. maximum.*

magellense (*S. olympicum*). Evergreen per. to 4 in.: lvs. alternate or opposite, obovate, ¼ in. long: fls. white, ¼ in. across, in late spring. Italy, Greece, Asia Minor.

Maximowiczii: *S. Aizoon.*

maximum. Ann. to 3 ft.: lvs. commonly opposite, broadly ovate, to 3 in. long, toothed: fls. greenish-white, ⅜ in. across, in late summer. Eu., S. W. Asia. Var. **atropurpureum** has deep purple lvs. and st.

mexicanum. Evergreen decumbent or trailing bright green per., floriferous and useful in pots, hanging-baskets and porch-boxes: lvs. nearly terete, to ½ in. long: fls. golden-yellow, sessile, to ½ in. across. Nativity in doubt.—Sometimes known as *S. aureum.*

Middendorffianum. Tufted per. to 1 ft.: lvs. alternate, nearly linear, 1½ in. long, toothed: fls. yellow, ⅝ in. across, in summer. Siberia, Manchuria.

moranense. Evergreen much branched low per., sts. 3–4 in. high, red and wiry, bare and procumbent below: lvs. triangular, sessile, ⅛ in. long and half as broad: fls. white, red tinged on back, sessile, nearly ½ in. across. S. Mex.—Sometimes erroneously known in cult. as *S. Greggii* and *S. Liebmannianum.*

murale: *S. album* var.

Nevii. Per. to 4 in., tufted: lvs. alternate, spatulate, to ½ in. long: fls. white with purple anthers, ½ in. across, June. Mts. Va. to Ala. and Ill.

nicaeense: *S. altissimum* var. *latifolium.*

Nuttallianum. Tufted ann. to 3 in.: lvs. alternate, linear-oblong, to ⅗ in. long: fls. yellow, about ¼ in. across, in spring. Mo. to Tex.

obtusatum: *Gormania obtusata.*

olympicum: *S. magellense.*

oppositifolium: *S. spurium.*

oreganum: *Gormania oregana.*

oxypetalum. Erect glabrous subshrub to 3 ft., with st. becoming thick and stout at base: lvs. obovate, flat, sometimes retuse, to 1½ in. long: fls. ½ in. across, dull red, honey-scented. Mex.—Deciduous or semi-evergreen.

pallidum. Per. to 5 in.: lvs. linear, 1 in. long: fls. white or rose. Asia Minor, India.—This name has been erroneously applied to several other species.

Palmeri. Glaucous evergreen per., sts. decumbent and more or less rooting, to 9 in. high: lvs. spatulate, entire, about 1 in. long, alternate or in rosette: fls. ⅜ in. across, petals orange and sepals green, on drooping or wide-spreading branches. Mex.

pilosum. Bien. to 4 in.: lvs. densely imbricated, hairy, linear-spatulate to oblong-obovate, to ¾ in. long: fls. rose, to ⅜ in. across, in late spring. Asia Minor.

populifolium. Subshrub to 1½ ft.: lvs. alternate, ovate, ¾ in. long, toothed: fls. pale pink or white, to ⅜ in. across, in late summer. Siberia.

pruinatum. Evergreen, very glaucous, to 6 in. high: lvs. alternate, linear, ¾ in. long: fls. straw-colored, to ¾ in. across, in summer. Portugal.—The plants usually cult. under this name belong to *S. rupestre.*

pruinoides: listed name.

pulchellum. Evergreen, to 1 ft.: lvs. crowded, linear, cylindrical, ⅝ in. long: fls. rosy-purple, ½ in. across, in summer. E. U. S.

Purdyi. "Has densely crowded lf. rosettes which throw out red threads at the end of which are tiny plants": lvs. in rosette oblong-spatulate, to about 1 in. long. Calif.—Yet little known.

purpurascens: a trade name, perhaps a form of *S. Telephium;* the plant grown in S. Calif. under this name is *Sempervivum* or *Æonium arboreum.*

reflexum. Creeping evergreen, forming a mat, to 1 ft. high: lvs. crowded, linear, cylindrical, ½ in. long: fls. bright yellow, ⅝ in. across, in summer. Eu. Var. **cristatum** is a crested or fasciate form. Var. **minus**, a small form, is listed.

replesiana: listed name.

rhodanthum (*Clementsia rhodantha*). Erect glabrous per. with stout rootstock, sts. several, to 12 in., not branched, very leafy: lvs. linear-lanceolate, acute, flat, 1 in. long: fls. rose-color, about 1 in. long, in a dense raceme to 3 in. long. Mont. to Ariz.

Rhodiola: *S. roseum.*

rhodioloides (*S. frigidum. Rhodiola integrifolia*). Per. to 1 ft., diœcious, with fleshy rootstock: lvs. obovate or somewhat oblong, about ½ in. long: fls. usually dark purple. Colo., Calif. to Alaska.

roseum (*S. Rhodiola. Rhodiola rosea*). ROSEROOT. Per. to 1 ft., diœcious, with rose-fragrant root: lvs. scattered, imbricated, obovate, to 2 in. long: fls. yellow or greenish-yellow, ¼ in. across, in spring and early summer. Circumpolar regions.

rupestre. Creeping evergreen forming mats, to 1 ft. high, glaucous: lvs. crowded, linear, to ⅝ in. long: fls. golden-yellow, ½ in. across, in summer. Eu. Var. **Forsterianum** (*S. Forsterianum*) is a green form. Var. **minus** is smaller and glaucous.

sarmentosum. Prostrate evergreen: lvs. in 3's, broadly lanceolate, 1 in. long: fls. bright yellow, ⅝ in. across, in summer. N. China, Japan.

Schotti: listed name.

Selskianum. One of the Aizoon group: hairy per., with ann. erect sts. to 1½ ft. high: lvs. alternate, flat and scarcely fleshy, lance-oblong and the upper ones linear-oblong, toothed on upper half: fls. bright yellow, ¾ in. across, in large leafy umbel-like cluster. Manchuria.—Plants grown under this name may be *S. Ellacombianum.*

Semenovii. Per. to 2 ft.: lvs. crowded, linear, to 2 in. long: fls. greenish-white, in dense racemes to 3 in. long, in early summer. Turkestan.

sempervivoides. Bien. to 1 ft.: lvs. alternate, ovate, 1 in. long: fls. red, ½ in. across, in summer. Asia Minor.

sexangulare. Creeping evergreen, forming mats, to 3 in. high: lvs. usually in 6 spiral rows, linear, cylindrical, ¼ in. long: fls. yellow, ⅜ in. across, in summer. Eu.

Sieboldii. Decumbent per.: lvs. in 3's, nearly round, to 1 in. long, glaucous-blue or red: fls. pink, ½ in. across, in late autumn. Japan.

spathulifolium. Little evergreen glaucous per. tinged red when exposed: fl.-sts. to 5 in., leafy: lvs. of sterile shoots spatulate, flat and fleshy, 1 in. long, of fl. shoots oblong and sessile, very fleshy: fls. bright yellow, to ¾ in. across, in a leafy cyme. B. C. to Calif.—This name may be applied in cult. to *S. confusum.*

speciosum: trade name.

spectabile. Glaucous per. to 1½ ft.: lvs. opposite or in 3's, obovate, 3 in. long: fls. pink, ½ in. across, in autumn. Japan, Cent. China. Var. **album** has white fls., **atropurpureum** and **rubrum** crimson fls.—*Crassula portulacea* is also grown under this name.

spurium (*S. oppositifolium*). Creeping per. forming mats, nearly evergreen, to 6 in. high: lvs. opposite, obovate, 1 in. long: fls. pink varying to white, ½ in. across, in summer. Caucasus. Var. **splendens** is a deep crimson form. Var. **coccineum** is in the trade.

Stahlii. Evergreen to 8 in.: lvs. opposite, ovoid, ½ in. long: fls. yellow, ½ in. across, in summer and autumn. Mex.

stellatum. Ann. to 6 in.: lvs. alternate, spatulate, to 1 in. long: fls. purplish, ⅜ in. across, in early summer. S. Eu.

stenopetalum. Evergreen per. to 6 in., tufted: lvs. alternate or crowded, linear-lanceolate, to ¾ in. long: fls. bright yellow, ½ in. across, June. Alta. to Calif.

stoloniferum (*S. ibericum*). Creeping, nearly or quite evergreen, to 6 in. high: lvs. opposite, spatulate, 1 in. long: fls. rose, ½ in. across, in early summer. S. W. Asia. Var. **coccineum** is offered, with pink fls. and foliage deep bronze in winter.

telephioides. Per. to 10 in., glaucous and purplish: lvs. scattered, oblong, to 2 in. long, often toothed: fls. pale pink, ¼ in. across, in autumn; petals 3–4 times as long as sepals. N. Y. and Pa. to N. C. and Ga.

Telephium. Per. to 1½ ft.: lvs. obovate-oblong, 3 in. long, toothed: fls. red-purple, in late summer. W. Eu. to Japan; see *S. triphyllum.* Var. **Borderi** (sometimes known as *S. carpaticum*) has deeply and irregularly toothed lvs.; var. **purpureum** has purple lvs.

ternatum. Evergreen, to 6 in.: lvs. in 3's, obovate, to 1 in. long: fls. white, ½ in. across, in late spring. E. U. S.

Tournefortii: a listed name.

triphyllum. Per. forming clumps, sts. erect, simple, to 2 ft. and more: lvs. alternate, ovate or oval or somewhat obovate, dentate, to 2 in. long: fls. purple, in dense terminal cyme; petals two times as long as sepals. W. Asia.—In old yards as live-for-ever and nat.; once confused with *S. telephioides* and *S. Telephium.*

turgidum: *S. album.*

umbellatum: listed name.

uniflorum. Sts. weak and slender, 5–6 in. long: lvs. alternate, subterete, obtuse: fls. solitary at ends of branches, reddish. Luchu Isls.

Wallichianum: properly a synonym of *S. crassipes* but applied to other species.

Woodii. Per. to 4 in.: basal lvs. broad-spatulate, ½ in. long; lvs. of fl. shoots alternate, narrower: fls. yellow, ⅓ in. long. Ore.

yosemitense. Per., stoloniferous, very fleshy: sts. to 6 in. high with small obtuse spatulate to oblong lvs.; basal lvs. obovate to nearly orbicular: fls. light yellow, the petals about ¼ in. long and exceeding sepals. Yosemite.

SEED: the ripened ovule; the essential part is the embryo, and this is contained within integuments.

SEEDAGE: see *Propagation.*

SEGMENT: one of the parts of a leaf, petal, calyx, that is divided but not truly compound; one of the parts or petals in the perianth of monocotyledons.

SEKIKA: *Saxifraga sarmentosa.*

SELAGINELLA. The only genus of *Selaginellaceæ.* Moss-like branching flowerless herbs with numerous scale-like lvs. often of two kinds, the fruiting bodies (spores) borne in terminal sessile spikes; widely distributed; grown for the ornamental foliage out-of-doors and in the greenhouse, in conditions suitable for ferns.

Selaginellas are of easy cultivation in shady moist situations. Propagated by spores or cuttings in spring. Cuttings of some of the greenhouse kinds should be scattered over the soil of the propagating bench, covered with glass and kept in a temperature of 70°, until they form roots at the joints.

africana: *S. Vogelii.*

amœna: *S. caulescens.*

apoda (*apus*). BASKET S. Ann. with creeping flaccid sts. to 4 in. long: lvs. minute, pale green. Me. to Tex.

Braunii. Sts. erect, to 1½ ft. high, straw-colored, not branched below: lvs. scattered, very small. W. China.

Brownii: *S. Kraussiana* var.

cæsia: *S. uncinata, S. Willdenovii.*

caulescens (*S. amœna*). Sts. erect, stiff, to 2 ft. high, unbranched below, greenish: lvs. bright green, crowded. Malaya, China, Japan. Var. **japonica** (*S. japonica*) is less branched and graceful above.

cuspidata. Sts. much branched nearly to base, densely tufted: lvs. pale green edged with white. Cuba, Mex., Venezuela.

denticulata. Per. with matted creeping sts. 6 in. or less long: lvs. crowded, toothed. Medit. region.—Most of the material cult. under this name is *S. Kraussiana.*

elegantissima: a garden name.

Emmeliana. Sts. erect, to 1 ft. high, branched nearly to base: lvs. bright green, crowded. Trop. Amer. Var. **aurea** has yellowish lvs. and var. **variegata** is variegated with white.

erythropus. Sts. erect, to 1 ft. high, unbranched below, crimson: lvs. crowded, dark green. Trop. Amer.

flabellata. Sts. erect, stiff, to 8 in. high, with short unbranched part below: lvs. obliquely ovate. Tropics and subtropics.

grandis. Sts. erect, to 2 ft. high, unbranched below: lvs. lanceolate, long for the genus, dark green. Borneo.

hæmatodes. Sts. erect, to 2 ft. high, unbranched below, crimson. Venezuela to Peru.

japonica: *S Kraussiana* or *S. caulescens* var.

Kraussiana (*S. japonica*). Moss-like per. with creeping rooting sts.: lvs. crowded, bright green. Azores to S. Afr. Var. Brownii (*S. Brownii*) is a dwarf form and vars. aurea and variegata variegated.

lepidophylla. RESURRECTION PLANT. Sts. stiff, to 4 in. long, densely tufted, curling up into a ball when dry but will expand when put in water: fls. flat, crowded. Tex. to S. Amer.—See also *Anastatica.*

Mandaiana: a trade name.

Martensii. Per. with ascending sts. to 1 ft. long, branched to base and rooting in lower half: lvs. pale green. Mex. Var. variegata is marked with white.

pilifera. Much like *S. lepidophylla* but differing in the awl-shaped lvs. Tex., Mex.

regalis: a hort. name.

rupestris. ROCK S. Densely tufted per. with branching sts. to 5 in. long: lvs. tipped with a white awn. E. U. S.

serpens. Per. with trailing much branched sts. to 9 in. long: lvs. bright green, crowded. W. Indies.

uncinata (*S. cæsia*). Per. with creeping rooting sts. to 2 ft. long: lvs. blue-green, close together on the short branches. China.

viticulosa. Sts. erect, 1 ft. or less high, branched near top: lvs. crowded. Cent. Amer.

Vogelii (*S. africana*). Sts. erect, stiff, to 2 ft. high, unbranched below, brown: lvs. green or bronzed. Afr.

Wallichii. Sts. erect, to 4 ft. high, branched to base: lvs. crowded. India, E. Indies.

Willdenovii (*S. cæsia arborea*). Sts. straw-colored, erect when young but soon climbing to 20 ft. or more: lvs. blue-green, crowded. Tropics of Old World.

SELENICEREUS. *Cactaceæ.* Night-blooming clambering, trailing or climbing cacti, more or less epiphytic and reaching the tops of trees, with aerial roots and joints ribbed or angled, most of the 16 species bearing small spines: fls. large with long somewhat curved tube which is commonly covered in the axils of the scales with felt or hairs or bristles. S. U. S. to Argentina. See *Cacti.*

These are among the plants known as night-blooming cereus, raised under glass in cold countries and in the open in frostless places. They are readily grown, and old plants bloom freely.

Boeckmannii (*Cereus Boeckmannii*). Sts. to ¾ in. thick and strongly angled, ribs 3–8, spines 3–6: fls. pure white within and brownish outside, not scented, to 15 in. long. Cuba, Hispaniola, E. Mex.

Donkelaarii (*Cereus Donkelaarii*). To 25 ft. or more but very slender, about ⅜ in. thick, ribs 9 or 10 and sometimes indistinct, spines 10–15, central 1: fls. white, reddish outside, about 7 in. long. Yucatan.

grandiflorus (*Cereus grandiflorus*). Sts. rather stout, about 1 in. diam., ribs 7 or 8 or fewer, spines needle-like and intermixed with white hairs: fls. white, salmon outside, about 7 in. long. Jamaica, Cuba.

hamatus (*Cereus hamatus. C. rostratus*). Branches about ½ in. thick, strongly 4-angled or seldom 3-angled, areoles often forming spur-like reflexed processes, spines few on old branches and black: fls. white, pale green outside, to 10 in. long. S. and E. Mex.

Macdonaldiæ (*Cereus Macdonaldiæ*). Old sts. terete, about ½ in. thick, younger ones somewhat 5-angled, several and very short: fls. pure white, reddish or yellowish on outside, to 12 in. or more long. Probably Uruguay and Argentina.

pteranthus (*Cereus pteranthus. C. nycticallus*). Sts. stout, to 1 or 2 in. thick, strongly 4–6-angled, spines 1–4, dark: fls. very fragrant, white, 10–12 in. long. Mex.

spinulosus (*Cereus spinulosus*). Sts. 1–2 in. thick and bearing many roots, commonly angled, ribs 4–6 or more, spines very short, the radials 5 or 6 and with 2 reflexed bristles at base, central 1 or 2: fls. pinkish to white, about 5 in. long. S. E. Tex., Mex.

SELENIPEDIUM. *Orchidaceæ.* As now defined, a genus of trop. American orchids with 2 fertile anthers borne on the side of the column, a large simple inflated sac-like lip with entire incurved margins, 3-celled ovary. Most of the plants cult. in greenhouses under this name are now referred to Paphiopedilum, probably no true Selenipediums being generally known to hort.

SELF-HEAL: *Prunella vulgaris.*

SEMELE. *Liliaceæ.* One shrubby vine from the Canary Isls. suitable for greenhouse cult. or out-of-doors in the S. S. androgyna (*Danaë androgyna*). CLIMBING BUTCHERS BROOM. Lvs. represented by scales, the apparent lvs. being leaf-like branches or cladodes to 4 in. long and 2 in. or more broad, ovate, leathery: fls. small, yellow, borne in clusters on the margins of the cladodes. Sometimes cult. as an Asparagus.

SEMMANTHE. *Aizoaceæ.* S. African somewhat woody branching plants once included in Mesembryanthemum (which see). S. lacera (*M. lacerum*) grows to 3 ft. high, with 2-angled branches: lvs. somewhat scimitar-shaped, sharply 3-angled, glaucous, toothed on keel, to 2 in. long: fls. rose, large, the inner petals short.

SEMPERVIVUM. HOUSELEEK. *Crassulaceæ.* Old World succulent per. herbs and subshrubs, usually without distinct trunk or caudex, with thick lvs. compacted into basal or terminal rosettes, the st.-lvs. smaller, alternate and often bract-like: fls. greenish, white, rose, yellow or purple, in terminal usually compact cymes; parts of the fl. 6 to many, the stamens two times as many as the petals. Numerous names are known in cult. but many of them represent variants or hybrids of a few species, particularly of *S. tectorum.* The species entered here are presumably hardy in the northern states. The species native in the Canary and Madeira Isls. are better kept distinct, in the genera Æonium and Aichryson represented by plants grown in the United States, and also in Greenovia but of which no species appear to be in the American trade.

One houseleek, *S. tectorum,* is an old-fashioned plant about houses and in borders, prized for its durable rosettes and the progeny of smaller ones. In European countries it often grows on roofs, whence the Latin name (*tectum,* roof); it is also somewhat escaped in this country. The shrubby *S. arboreum* (*Æonium*) is commonly planted in southern California. Other and tender kinds are sometimes grown under glass for ornament and curiosity. A good number of hardy kinds are useful in rock-gardens, spreading slowly. Propagation is naturally by the small rosettes or offsets; they grow readily from seeds when available, but some of them seldom bloom.

acuminatum: *S. glaucum.*

Alberti: *Sedum Alberti.*

albidum: a whitish form of *S. tectorum.*

anomalum: a form of *S. tectorum.*

arachnoideum. COBWEB H. To 4 in.: rosettes ¾ in. across, the lvs. connected by cobwebby strands, tipped with long hairs: fls. bright red, 1 in. across, in a dense few-fld. glandular panicle. Mts., S. Eu. Var. **Laggeri** (*S. Laggeri*) is a larger form, with rosettes twice as broad. Var. **tomentosum** (*S. tomentosum*) has white-tomentose rosettes.—*S. piliferum* is a form of *S. arachnoideum* or a hybrid between it and *S. tectorum.*

arboreum: *Æonium arboreum.*

arenarium (*S. cornutum*). To 9 in.: rosettes globular, the lvs. reddish-brown on back: fls. pale yellow tinted reddish outside, about ⅓ in. long, petals tricuspidate. Tyrol.—Plants grown under this name are likely to be a form or hybrid of *S. montanum.*

arvernense (*S. Boutignyanum*). To 8 in.: rosettes 2½ in. across, the lvs. oblong-lanceolate, cuspidate, about 1 in. long, with red-brown blotch at top: fls. pale pink, about ⅓ in. long, in panicle 3 in. long. France.—This plant is a form of *S. tectorum.*

assimile: *S. Schlehani*; but the plant grown under the name is likely to be *S. tectorum.*

assinoti: listed name: *S. assimile?*

atlanticum. To 1 ft.: rosettes to 3 in. across, the lvs. oblanceolate, cuspidate, to 1½ in. long, pale green: fls. pale red, 1 in. across, in panicle 3–4 in. across. Morocco.—Considered to be a subspecies of *S. tectorum.*

atroviolaceum: listed name.

blandum (*S. rubicundum*). To 10 in., pubescent: rosettes to 2 in. diam., the lvs. obovate and short-cuspidate and with ciliate margins, glaucous: fls. pale rose. Transylvania.—Probably the plant that has been listed as *S. blandense.*

Boissieri. A form of *S. tectorum*: to 9 in.: rosettes 2½ in. across, the oblanceolate cuspidate lvs. tipped with red-brown, about 1 in. long: fls. pale red, 1 in. across, in a close small panicle.

Boutignyanum: *S. arvernense.*

Braunii. To 9 in.: rosettes to 2 in. across, lvs. obovate, slightly cuspidate, glandular, to 1 in. long: fls. dull yellow, with greenish keels, to 1 in. across, in a close panicle to 4 in. across. Tyrol.—To be regarded as a pale-fld. form of *S. montanum.*

Brownii: presumably an erroneous spelling of the preceding.

cæspitosum: *Æonium cæspitosum.*

calcareum (*S. californicum*). To 1 ft.: rosettes 2 in. across, the very glaucous lvs. oblanceolate and cuspidate, tipped with red-brown: fls. pale red, ¾ in. across, in a panicle 3–4 in. long. France.—A subspecies of *S. tectorum.*

californicum: *S. calcareum.*

canariense: *Æonium canariense.*

Chamædrys: listed name; probably not a Sempervivum.

Comollii: probably hybrid of *S. tectorum* and *S. Wulfeni.*

cornutum: *S. arenarium.*

cuneatum: *Æonium cuneatum.*

decorum: *Æonium decorum.*

dichotomum: *Aichryson dichotomum.*

Doellianum: form of *S. arachnoideum.*

Doramæ: *Æonium undulatum.*

Fauconnetti. To 8 in.: rosettes 1½ in. across, the oblanceolate lvs. tinged with red or purple, about ¾ in. long: fls. bright red, 1 in. across. Jura Mts.—Perhaps a hybrid of *S. arachnoideum* and *S. tectorum.*

fimbriatum. To 10 in., glandular: rosettes 1½ in. across, the oblanceolate lvs. tipped with a tuft of hairs, outer becoming red: fls. bright red, 1 in. across, in open panicle. Pyrenees, Tyrol.—Regarded as a hybrid between *S. arachnoideum* and *S. Wulfeni.*

flagelliforme. To 4 in.: rosettes 1½ in. across, the lvs. pale green, oblanceolate and pubescent, to ¾ in. long: fls. bright red, 1 in. across, glandular, nearly or quite sessile in a dense head. Siberia.—The plant grown under this name may be a form of *S. glaucum.*

Funckii. To 9 in.: rosettes 2 in. across, the lvs. oblanceolate and cuspidate: fls. bright red-purple, 1 in. across, glandular, in a panicle 2–3 in. across. S. Eu.—A hybrid; but the plant passing under this name is probably *S. calcareum.*

glaucum (*S. acuminatum. S. Schottii*). To 1 ft., sts. hairy above: rosettes to 3 in. across, the oblanceolate lvs. glaucous with brownish spot at tip: fls. red, 1 in. across, in panicles 2–3 in. long. Cent. Eu.

globiferum. To 1 ft.: rosettes to 3 in. across: fls. pale yellow, to 1 in. across. Russia.—A dubious name; the plant so called is apparently a form or hybrid of *S. montanum.*

gnaphalium: sometimes applied to *S. arachnoideum.*

grandiflorum. To 8 in.: rosettes 1½ in. across, the obovate lvs. pale green and pubescent, to 1 in. long: fls. pale yellow, to 1½ in. across. European Alps.

Greenii. A form of *S. tectorum* but the plant in cult. may be *S. glaucum*: to 6 in.: rosettes 1½ in. across, the oblanceolate glaucous lvs. tipped with red-brown, to 1 in. long: fls. pale red, ½ in. across, in small panicle. French Alps.

Hausmannii. To 6 in.: rosettes with lvs. ciliate on margin and tipped with brown and a tuft of hairs: fls. rose-red. Tyrol.—Probably hybrid of *S. arachnoideum* and *S. montanum.*

Haworthii: *Æonium Haworthii.*

Heuffelii (*S. patens*). To 8 in.: rosettes 2 in. across, the lvs. obovate and cuspidate, with white-ciliate margins and upper part tinted red-brown: fls. pale straw-color, nearly ½ in. long, in dense panicle to 3 in. across. Transylvania, Greece.

hirtum. To 9 in.: rosettes 1¼ in. across, the obovate lvs. glandular-pubescent: fls. pale yellow, to ¾ in. long, in panicle to 4 in. across. S. Eu.

hispidum: trade name; apparently a form or hybrid of *S. montanum.*

holochrysum: *Æonium holochrysum.*

Hookeri: listed name.

hybridum: *Æonium cæspitosum.*

Laggeri: *S. arachnoideum* var.

LaHarpei: trade name without botanical standing.

Lamottei: form of *S. tectorum* or hybrid from it.

Mettenianum. To 6 in.: rosettes to 2 in. across, the lvs. marbled and tipped with red-brown: fls. rose. Cent. Eu.—Considered a form of *S. tectorum.*

Moggridgei. To 9 in.: rosettes 2 in. across, the long-cuneate or oblanceolate lvs. ¾ in. long and tipped with tufts of hairs: fls. red. ¾ in. across, calyx glandular. S. Eu.—An offshoot of *S. arachnoideum.*

montanum. To 6 in.: rosettes compact, to 1¾ in. across, lvs. oblanceolate, ciliate, to 1 in. long: fls. bright mauve-red or purplish, in a hairy panicle to 2 in. across. Alps, Pyrenees.

patens: *S. Heuffelii.*

piliferum: see *S. arachnoideum.*

Pittonii. To 6 in.: rosettes 1½ in. across, the oblanceolate pubescent lvs. blotched and tipped with light red: fls. yellowish-white, in a dense hairy head. Styria.

pumilum. To 4 in.: rosettes to 1 in. across, the lvs. pubescent: fls. bright mauve-purple, 1 in. across. Caucasus.

pyrenaicum. To 10 in.: rosettes 2 in. across, the lvs. glaucous tipped with reddish: fls. pale rose. Eu.—A form of *S. tectorum.*

Reginæ-Amaliæ: *S. Schlehani.*

robustum: a form of *S. tectorum.*

rubicundum: *S. blandum.*

rupestre: *S. tectorum* or a form of it; plants grown under this name, however, are likely to be a form or hybrid of *S. montanum.*

rupicolum (*S. montanum* × *S. Wulfeni*). Rosettes to 2 in. across, lvs. reddish at base: fls. pale greenish-yellow striped with red. Tyrol.

ruthenicum. To 12 in.: rosettes 1½ in. diam., the lvs. obovate and pubescent, short-ciliate: fls. pale yellow, the petals about ⅓ in. long, filaments purple. E. Eu.

Schlehani (*S. assimile. S. Reginæ-Amaliæ*). To 6 in.: rosettes 2 in. across, the lvs. obovate, pale, nearly glabrous, to 1 in. long: fls. pale rose, ¾ in. across, calyx densely pubescent. Translvania.

Schottii: *S. glaucum.*

soboliferum. To 9 in.: rosettes 1½ in. across, lvs. obovate, to 1 in. long, the outer ones brown-tinged: fls. pale yellow, in dense panicle to 4 in. across. Austria.—Plants so named may be a form of *S. montanum.*

spathulatum: *Æonium spathulatum.*

spinulifolium: trade name of uncertain application.

tabulæforme: *Æonium tabulæforme.*

tectorum. Common or Roof Houseleek. Hen-and-Chickens. Old-Man-and-Woman. To 12 in.: rosettes 3–4 in. across, with many cuneate-obovate cuspidate lvs. to 3 in. long: fls. pink-red, to 1 in. across, on secund curving hairy branches, the petals mostly 12. Eu., Asia, variable; somewhat run wild in U. S.

tomentosum: *S. arachnoideum* var.

tortuosum: *Aichryson domesticum.* Var. **variegatum** is listed.

triste. A form of *S. tectorum:* to 1 ft.: rosettes to 3 in. across, lvs. oblanceolate and cuspidate, the upper part of lvs. red-brown: fls. bright red, 1 in. across, in panicle to 6 in. long.

undulatum: *Æonium undulatum.*

Wulfeni. To 9 in.: rosettes 2 in. across, lvs. obovate and cuspidate, slightly glaucous, ciliate, reddish at tip, to 1 in. long: fls. pale yellow, in dense hairy panicle 2–3 in. across. Cent. Eu.

SENEBIERA: *Coronopus.*

SENECIO (incl. *Cineraria* and *Kleinia*). Groundsel. *Compositæ.* A vast number of widely dispersed herbs, shrubs and small trees, sometimes fleshy, with alternate or basal lvs. and solitary or clustered heads of variously colored ray- and disk-fls.; involucral bracts in 1 series, usually reinforced at the base with shorter bracts having a calyx-like appearance but the margins not overlapping as in Ligularia; pappus of soft whitish bristles.

A few herbaceous kinds are grown for flowers, foliage or climbing habit. They are of easy culture. Practically all the species may be propagated by seed, the perennials by division; stem- and root-cuttings may be employed. *S. mikanioides* is easily increased by cuttings of the running shoots.

abrotanifolius of lists is *S. adonidifolius.*

acanthifolius: *S. Cineraria.*

aconitifolius. Hardy per., tall: lvs. palmately parted, lobes somewhat toothed: heads small, pinkish-red, in loose corymbs, of disk-fls. only. Amur, N. China.

adonidifolius (*S. abrotanifolius*). Per. to 1½ ft.: lvs. finely pinnately cut: heads small, brilliant orange, in a compound corymb. S. Eu.

alatus. Per. to 2 ft.: lvs. ovate or ovate-lanceolate, to 1 ft. long, the petiole with broad toothed wings: heads ½ in. long, in branched panicles. Himalayas.

articulatus (*Kleinia articulata*). Candle-Plant. To 2 ft., the branches swollen and fleshy: lvs. deeply lobed, to 2 in. long: heads white, in long-stalked corymbs, of disk-fls. only. S. Afr.

aurantiacus (*Cineraria aurantiaca*). Per. to 1½ ft.: lvs. oval, basal, with only a few linear st.-lvs.: heads orange-red. Alps.

aureus. Golden G. Golden Ragwort. Per. to 2 ft.: basal lvs. cordate-ovate, to 6 in. long, toothed, sometimes tinged purple beneath; st.-lvs. pinnately cut: heads yellow, ¾ in. across, in corymbs. Newf. to Fla. and Tex.

Balsamitæ: *S. pauperculus.*

Bidwillii. Shrub to 5 ft., white-tomentose: lvs. oblong, to 2 in. long, leathery and thick: heads ¼ in. across, in corymbs, of disk-fls. only. New Zeal.

Buchanani: *S. elæagnifolius* var.

Cineraria (*Cineraria maritima. S. acanthifolius*). Dusty Miller. Per. to 2½ ft., stiff, white-woolly: lvs. pinnately cut into oblong blunt segms.: heads yellow or cream, to ½ in. long, in cymes. Medit. region.—Blooms all seasons in favorable climates; hardy N. in protected places; favorite for the white herbage. Var. **aureo-marginatus**, lvs. bordered with orange-yellow. For var. *candidissimus* see *S. leucostachys.*

clivorum: *Ligularia clivorum.*

compactus. Shrub to 3 ft., much branched: lvs. obovate, to 1½ in. long, slightly toothed, white-tomentose beneath: heads yellow, 1 in. across, in leafy racemes. New Zeal.

confusus. Glabrous vine or scandent shrub: lvs. thickish, narrowly ovate-acuminate, to 2 in. or more long, remotely dentate: heads with orange or orange-red rays, ½ in. or more across, in terminal clusters. Mex.; cult. in the Rio Grande region.

cruentus (*Cineraria cruenta*). Florists Cineraria. Short-stemmed woolly per.: lvs. large, cordate-ovate, undulate and toothed: fls. purple-red. Canary Isls.—The supposed parent of the florists cineraria, perhaps hybridized with other species, its fls. more or less double, in white, shades of blue, pink and red-purple. *Cineraria stellata* is of more open growth, 2 ft., the fl.-heads single and smaller. See *Cineraria.*

Doria. Per. to 4 ft., glabrous: lvs. oval-oblong, to 15 in. long, toothed, glaucous: heads yellow. Eu.

Doronicum. Leopards Bane. Per. to 2½ ft., pubescent: lvs. thickish, ovate to lanceolate, to 7 in. long, toothed to entire: heads orange or yellow, to 2½ in. across, few. S. Eu.

Douglasii. Subshrub to 6 ft., white-tomentose when young: lvs. linear or pinnate into linear lobes: heads yellow, ½ in. long, in corymbs. Calif. to Tex. and Nev.

elæagnifolius. Shrub to 10 ft., yellowish-tomentose: lvs. obovate to oblong-lanceolate, to 5 in. long, leathery: heads ⅓ in. across, in panicles, of disk-fls. only. New Zeal. Var. **Buchanani** (*S. Buchanani*) grows 4 ft. high and lvs. to 2 in. long.

elegans (*S. purpureus. Jacobæa elegans*). Purple Ragwort. Ann. to 2 ft., sticky-hairy: lvs. mostly oblong, to 3 in. long, pinnately lobed or toothed: heads in loose corymbs, rays purple or reddish, disk yellow. S. Afr.—There are double vars. and with white, rose and crimson fls. Flower-garden and conservatory plant.

ensifolius: trade name.

fibrillosus. Per. to 2 ft.: lvs. to 3 in. long, toothed: heads yellow, ⅓ in. across, in racemes, of disk-fls. only. China.

ficoides (*Kleinia ficoides*). Sts. fleshy and woody: lvs. powdery-glaucous, compressed, to 3½ in. long: heads whitish, in corymbs, of disk-fls. only. S. Afr.

Fuchsii. Per. to 5 ft.: lvs. oval to lanceolate, 6 in. long, toothed: heads yellow, fragrant, ½ in. long, in corymbs. Eu.

grandiflorus. Per. to 5 ft.: lvs. pinnate into linear segms.: heads with purple rays and yellow disk, in corymbs. S. Afr.

grandifolius. Shrub to 15 ft.: lvs. ovate, to 1½ ft. long, wavy-toothed, tomentose beneath: heads yellow, in cymes. Mex.

Greyii. Shrub to 8 ft.: lvs. oblong or oblong-ovate, to 3½ in. long, leathery, white-tomentose beneath: heads yellow, 1 in. across, in corymbs to 5 in. across. New Zeal.

Hectori. Shrub to 12 ft.: lvs. oblong-lanceolate, to 1 ft. long, crowded toward end of branchlets, toothed to pinnatifid, white-tomentose beneath: heads white, to 2 in. across, in large corymbs. New Zeal.

Heritieri. Per. somewhat shrubby, about 1 ft.: lvs. suborbicular, to 1¾ in. broad, 5–7-lobed, white-woolly beneath: heads mostly solitary, purple. Teneriffe.

Huntii. Shrub or tree to 20 ft., sticky-pubescent: lvs. elliptic-lanceolate, to 4 in. long, entire: heads yellow, to ¾ in. across, in large panicles. Chatham Isls. (New Zeal.).

incanus. Per. to 6 in.: lvs. pinnately cut, white-woolly: heads yellow, about ½ in. across, in corymbs. Alps.

Jacobæa. Tansy Ragwort. Bien. or per. to 4 ft.: lvs. to 8 in. long, 2–3-pinnately cut: heads yellow, ½ in. across, in many-fld. corymbs. Eu.; nat. in E. N. Amer.

japonicus: *Ligularia japonica.*

Kaempferi: *Ligularia Kaempferi.*

Ledebourii: *Ligularia macrophylla.*

leucostachys. Shrubby at base but herbaceous as usually grown from cuttings, white-tomentose: lvs. pinnatifid into linear lobes: heads in compound corymbs. Argentina.—Known in cult. as *S. Cineraria* var. *candidissima;* distinguished from *S. Cineraria* by less stiff habit and the numerous very narrow lf.-lobes; good plant for porch boxes.

lobatus. Ann. or bien., to 3 ft., often somewhat woolly: lvs. pinnately parted, with broad toothed segms.: heads yellow, with narrow rays. S. E. U. S.—The plant grown as *Cineraria lobata* has slender very diffuse habit, and roundish notched lvs. S. Afr.

Lyallii. Per. to 1½ ft., pubescent: lvs. linear, to 10 in. long, entire: heads yellow, to 2½ in. across, in large corymbs. New Zeal.

macrophyllus (*Jacobæa macrophylla*). Per. to 4 ft.: lower lvs. obovate-oblong, to 1½ ft. long: heads yellow, in compound cymes. Eu.

mikanioides. GERMAN IVY. Tall-twining: lvs. ovate with deep basal sinus, sharply 5–7-angled: heads small, yellow, in close clusters, of disk-fls. only. S. Afr.—Often known erroneously as *S. scandens;* an old window-garden and conservatory plant.

Monroi. Shrub to 6 ft., white-tomentose: lvs. oblong, to 1½ in. long, leathery, wavy-margined: heads yellow, to ⅔ in. across, in corymbs. New Zeal.

multibracteatus. Ann. to 1½ ft.: lvs. lanceolate, to 2½ in. long, with few coarse teeth: heads in long-stalked corymbs, rays purple, disk yellow. S. Afr.

nebrodensis. Ann. or bien. to 1½ ft.: lvs. pinnately cut: heads yellow, to 1 in. across, in corymbs. Eu.

obovatus. Per. to 2 ft.: basal lvs. obovate or oblong, to 4 in. long, wavy-toothed; st.-lvs. often pinnatifid: heads yellow, ½ in. across, in corymbs. Me. to Fla. and Tex.

palmatifidus: hort. name, probably for *Ligularia japonica.*

pauciflorus: an uncertain name.

pauperculus (*S. Balsamitæ*). BALSAM G. Per. to 1½ ft.: basal lvs. oblong, to 5 in. long, wavy-toothed; st.- lvs. pinnately cut: heads yellow, to ¾ in. across, in corymbs. Newf. to B. C. and Neb.

Petasitis. VELVET G. CALIFORNIA-GERANIUM. Bold per. to 8 ft.: lvs. ovate or suborbicular, 9–13-lobed, to 8 in. across, grayish-tomentose beneath: heads yellow, in terminal many-headed panicles. S. Mex.

petrocallis. Per. to 4 in.: basal lvs. nearly orbicular, to ¾ in. long: heads golden-yellow, ½ in. long, solitary or in 2's. Mts., Colo., Utah, Ida.

pulcher. Per. to 4 ft., white-cobwebby: lvs. oblong-lanceolate, to 10 in. long, thick, shallow lobed or toothed: heads to 3 in. across, rays red-purple, disk yellow. Uruguay, Argentina.

purpureus: *S. elegans.*

remotifolius. Shrub to 6 ft.: lvs. to 5 in. long and 3 in. wide, tomentose beneath: heads ⅓ in. across, in panicles to 6 in. long, of disk-fls. only. New Zeal.

rotundifolius. Shrub or tree to 30 ft.: lvs. orbicular or broad-oblong, to 5 in. across, thick and leathery, yellowish-tomentose beneath: heads ⅓ in. across, in panicles, of disk-fls. only. New Zeal.

scandens. CLIMBING G. Woody, climbing to several ft.: lvs. ovate or oval-lanceolate, sometimes with a few divisions at base of blade, toothed, grayish-green, pubescent: heads yellow, in panicles. China.—See *S. mikanioides.*

scorzoneroides. Per. to 14 in., pubescent: lvs. linear- or ovate-lanceolate, to 8 in. long, entire: heads white, yellow or pinkish, to 2 in. across, in large corymbs. New Zeal.

sibiricus: *Ligularia sibirica.*

speciosus. Per. to 2 ft.: lvs. obovate or lanceolate, to 7 in. long, toothed or lobed, glandular-hairy: heads bright purple, 1½ in. across, in spreading corymbs. S. Afr.

stenocephalus: *Ligularia stenocephala.*

subscandens. Climbing herb: lvs. to 4 in. long, pinnate into oblong or ovate toothed lobes: heads ochre-yellow, ⅓ in. long, in much branched cymes. Trop. Afr.

succulentus (*Kleinia repens. Cacalia repens*). Low, sts. succulent-shrubby: lvs. clustered, fleshy, to 1½ in. long, cylindrical, glaucous: heads pale yellow, ½ in. long, in few-headed corymbs. S. Afr.

sylvaticus. Ann. to 1½ ft.: lvs. pinnately cut into linear toothed lobes, white-hairy: heads yellow, in corymbs. Eu.

tanguticus. Per. to 7 ft.: lvs. broadly ovate or triangular, to 7 in. long, pinnately divided into toothed segms., pale: heads yellow, very numerous in terminal pyramidal panicles. W. China.

thapsoides. Per. or bien.: lvs. oblong, wavy-toothed, white-tomentose beneath: heads ⅓ in. across, in racemes, of disk-fls. only. Greece.

tyroliensis: a listed name.

Veitchianus: *Ligularia Veitchiana.*

viscosus. Ann. to 1½ ft., sticky-hairy: lvs. pinnate into lanceolate segms.: heads yellow. Eu., W. Asia.

Visianus. To 2 ft., white-tomentose: lvs. oblong-lanceolate, jagged-toothed, cobwebby above, densely tomentose beneath: heads yellow, in panicles. Montenegro.

Wilsonianus: *Ligularia Wilsoniana.*

SENNA: *Cassia.* Bladder: *Colutea.* Scorpion: *Coronilla Emerus.*

SENSITIVE-PLANT: *Mimosa pudica.*

SEPAL: one of the separate leaves of a calyx.

SEQUOIA. *Pinaceæ.* Two titanic evergreen trees native in W. N. Amer., often becoming 300 ft. or more high and with immense boles, with linear or scale-like lvs. and drooping cones with woody scales. For cult. see *Conifers.*

gigantea (*S. Washingtoniana. Wellingtonia gigantea*). GIANT S. Lvs. scale-like, to ½ in. long, appressed to the st.: cones to 3½ in. long. Western slopes of Sierra Nevada, Calif.; trees will persist in Cent. N. Y. to 30 ft. or more in height in protected places, but are reliable only in the central states. Var. **aurea** has yellow lvs., var. **glauca** bluish, and var **pendula** strongly deflexed branches forming a narrow column.

sempervirens. REDWOOD. Lvs. linear, to 1 in. long, mostly spreading in 2 ranks: cones to 1 in. long. S. Ore., N. and Cent. Calif. in the Coast ranges; to be planted, outside its native regions, only far S. or in very mild climates. Var. **adpressa** has young lvs. and tips of branchlets creamy, var. **glauca** bluish lvs., and var. **pendula** drooping branches.

Washingtoniana: *S. gigantea.*

SERAPIAS: *Amesia gigantea.*

SERENOA. SAW- or SCRUB-PALMETTO. *Palmaceæ.* One hermaphrodite small fan-palm, S. C. to Fla. and Tex., unarmed except for the numerous fine saw-teeth on the slender petiole: spadix axillary, much branched, usually surpassing the petioles; fls. narrow-oblong in bud, fragrant; stamens 6: fr. an ovoid or globose 1-seeded black drupe, ½–¾ in. long. See *Palm.*

arborescens: *Acœlorraphe Wrightii.*

repens (*Sabal* and *S. serrulata*). Mostly with prostrate or creeping branching sts. and making great masses or colonies, sometimes the trunk erect and several ft. tall: lf.-blades 2–2½ ft. across, either green or glaucous, cleft below the middle into 20 or more rather stiff segms. bifid at apex. In its apparently acaulescent form it covers great areas.

serrulata: *S. repens.*

SERICOCARPUS. *Compositæ.* N. American aster-like per. herbs with alternate lvs. and panicled heads of white ray-fls. and yellowish or purplish disk-fls.; pappus of bristles. Sometimes transferred to the wild-garden or border.

asteroides. To 2 ft.: lvs. obovate or oblong, toothed or entire, to 4 in. long: heads ½ in. long. Me. to Fla. and Ala.

SERICOGRAPHIS: *Jacobinia pauciflora.*

SERICOTHECA: *Holodiscus.*

SERISSA. *Rubiaceæ.* One shrub to 2 ft., native in S. E. Asia and grown under glass and in the open far S. Propagated by cuttings over heat. **S. fœtida** (*S. japonica*). Lvs. opposite, small and clustered on flowering branchlets, ovate, to ½ in. long, fetid when bruised: fls. white, to ½ in. long, funnelform with 4–6-lobed limb, solitary or clustered. Var. variegata has lvs. margined with yellow.

SERJANIA (or *Seriania*). *Sapindaceæ.* Woody twining or tendriliferous vines bearing alternate mostly pinnate compound lvs., yellowish irregular polygamous fls. in axillary racemes or panicles, and winged frs.; sometimes grown in S. Calif. and similar climates; native in trop. and semi-trop. Amer.

fuscifolia. Lvs. biternate into ovate toothed lfts. rufous-pubescent beneath: fr. ovate or elliptic, about ½ in. long. Brazil.

glabrata. Lvs. biternate into ovate coarsely toothed glabrous lfts.: fr. cordate-ovate, 1¾ in. long. S. Amer.

SERRADELLA: *Ornithopus sativus.*

SERRAFALCUS HUGHI: *Bromus intermedius.*

SERRASTYLIS: *Macradenia modesta.*

SERRATE: saw-toothed.

SERRATULA. *Compositæ.* Per. herbs of Eu., N. Afr. and Asia, allied to Centaurea: lvs. alternate, toothed or cut: heads purple, solitary or in corymbs, of disk-fls.; pappus of hairs. Sometimes planted in the border.

nudicaulis. To 3½ ft.: lvs. oblong or oval, entire or toothed below: heads solitary. Eu.

tinctoria. To 3 ft.: lvs. variable, deeply pinnatifid or sometimes entire: heads about ½ in. long, in loose corymbs. Cent. Eu.

SERVICE-BERRY: *Amelanchier.* **-Tree:** *Sorbus domestica* and *torminalis.*

SESAME: *Sesamum orientale.*

SESAMUM. *Pedaliaceæ.* African and Asian herbs with often rough foliage, 5-lobed 2-lipped tubular fls. solitary in the axils, and capsular frs.; one species grown for the seeds which yield bene oil. In the N. grown as an ann. from seeds; sometimes raised under glass for interest.

indicum: *S. orientale.*

orientale (*S. indicum*). Sesame. To 2 ft.: lvs. oblong or lanceolate, to 5 in. long, sometimes 3-lobed: fls. pink or white, 1 in. long, with shorter upper lobes: caps. 1 in. or more long, with 4 grooves. Tropics.

SESBANIA (*Sesban*). *Leguminosæ.* Herbs or shrubs with pinnate lvs., papilionaceous fls. in axillary racemes, and long compressed pods; grown for ornament in warm climates and one for cover-cropping.

aculeata: *S. bispinosa.*

bispinosa (*S. aculeata*). To 10 ft., prickly: lfts. to ½ in. long: fls. pale yellow spotted with reddish-brown, in racemes to 6 in. long: pods 8 in. long. Tropics.

exaltata (*S. macrocarpa*). Ann. to 12 ft.: lfts. to 1 in. long: fls. yellow spotted with purple, in racemes to 4 in. long: pods to 9 in. long. Mo. to La. and Tex.—Sometimes employed as green-manure.

grandiflora: *Agati grandiflora.*

macrocarpa: *S. exaltata.*

punicea: *Daubentonia punicea.*

Tripetii: *Daubentonia Tripetii.*

SESSILE: not stalked; sitting.

SETARIA (*Chætochloa*). *Gramineæ.* Ann. or per. grasses distributed in warm regions, one a valuable grain and fodder plant and a few others ornamental: spikelets subtended by persistent bristles longer than the spikelet, borne in terminal spike-like panicles. See *Grasses.*

italica (*S. macrochæta. Panicum germanicum*). Foxtail Millet. Ann. to 5 ft.: lvs. to 1 ft. or more long and 1 in. wide, rough: spikes to 1 ft. long and 2 in. across, curved or nodding, the bristles green, brown or purplish: fr. yellow, brown, red or black. Cultigen but widely spread. Var. **nigrofructa**, Hungarian-Grass, has brown bristles, dense spikes to 3 in. long, and nearly black frs. Var. **rubrofructa**, Siberian and Turkestan M., has purple bristles and reddish or orange fr. Var. **stramineofructa**, German and Golden Wonder M., has very large spikes and yellow fr.

macrochæta: *S. italica.*

palmifolia (*Panicum palmifolium*). Palm-Grass. Per. to 6 ft.: lvs. to 2 ft. long and 3 in. wide in middle, plicate: panicles to 2 ft. long, open and interrupted. E. Indies.—Often grown in greenhouses and in the open far S. There is a form with striped lvs.

plicata (*Panicum plicatum. P. excurrens*). Often confused with *S. palmifolia* but the lvs. are smaller, to 8 in. long and ½ in. wide, and the panicles narrower.

Poiretiana. Tufted per. several ft. tall: lvs. to 1½ ft. long and 1 in. wide, strongly plicate: panicles to 2 ft. long, narrow, branches ascending. Mex. to Brazil.

sulcata (*Panicum sulcatum*). Similar to *S. Poiretiana* but taller with larger lvs. and more open panicles, the branches drooping. W. Indies to Ecuador.

SEVEN STARS: *Ariocarpus retusus.*

SEVERINIA. *Rutaceæ.* **S. buxifolia** (*Atalantia buxifolia, Triphasia monophylla*), the only species, native in S. China and Formosa, is an ornamental spiny shrub or small tree, suitable also for hedges far S.: lvs. simple, ovate-oblong and rounded or emarginate at apex, petiole very short: fls. small, white, solitary or few in axils; stamens 10, not united: fr. a globular berry, shining black, about ⅓ in. diam.

SHADBUSH: *Amelanchier.*

SHADDOCK: *Citrus maxima;* see *Citrus Fruits* (page 156).

SHALLOT: see *Onion.*

SHALLU: *Holcus Sorghum* var. *Roxburghii.*

SHAWIA: *Olearia.*

SHEATH: any long or more or less tubular structure surrounding an organ or part; as the sheath of a grass leaf, being its lower part.

SHEEP-BERRY: *Viburnum Lentago.*

SHEEPS-BIT: *Jasione perennis.*

SHELL-FLOWER: *Alpinia speciosa, Molucella lævis.*

SHEPHERDIA (*Lepargyrea*). *Elæagnaceæ.* N. American shrubs or small trees with brown or silvery scales, having opposite simple lvs., small yellowish diœcious fls., and drupe-like frs.; grown for ornament and *S. argentea* for the frs. which are made into jelly. Adapted to dry rocky soils. Propagated by seeds sown in fall or stratified.

argentea. Buffalo-Berry. To 18 ft., thorny: lvs. oblong, silvery on both sides: fr. red or yellow in var. **xanthocarpa.** Man. to Minn. and Kans.—Sometimes grown for its edible frs. and as a hedge plant in the Northwest, valuable for its great hardiness.

canadensis. To 8 ft., thornless: lvs. ovate or oval, silvery beneath: fr. red or yellow. Newf. to Alaska and south.

SHERWOODIA: *Shortia galacifolia.*

SHIELDWORT: *Peltaria.*

SHINLEAF: *Pyrola.* **One-flowered:** *Moneses uniflora.*

SHOOTING-STAR: *Dodecatheon.*

SHORTIA. *Diapensiaceæ.* Attractive evergreen stemless herbs with creeping rootstocks, basal lvs., bell-shaped nodding fls. solitary on slender scapes, and capsular frs.; 2 species somewhat like Galax.

Shortias are grown in rock-gardens and similar places. They should be planted in shady situations and require leaf-mold and humus. Propagated by division and runners.

californica: *Baeria aristata.*

galacifolia (*Sherwoodia galacifolia*). OCONEE-BELLS. To 8 in.: lvs. orbicular, to 3 in. long, slightly wavy-margined: fls. white, 1 in. across. Mts. of N. C. and S. C. Var. **rosea** has rose fls.

uniflora. NIPPON-BELLS. Differs from *S. galacifolia* in the more heart-shaped and deeply wavy-margined lvs. Japan.

SHRUB: a woody plant that remains low and produces shoots or stems from the base and not a single trunk; contrast to tree, among woody plants; bush.

SIBBALDIOPSIS: *Potentilla tridentata.*

SIBIRÆA. *Rosaceæ.* Deciduous shrubs resembling spirea, having alternate entire lvs., small unisexual fls. in terminal panicles, and fr. of 2-seeded follicles united at base; native in Asia and S. E. Eu. Propagated by seeds or layers.

lævigata (*Spiræa lævigata*). To 5 ft.: lvs. oblong, to 4 in. long, bluish-green: fls. greenish-white, in panicles to 5 in. long. Siberia; hardy N.

SIBTHORPIA. *Scrophulariaceæ.* Creeping per. herbs with orbicular-reniform lvs. and yellow, yellowish-rose or red fls. with short tube and 4–8 corolla-lobes; grown as a ground-cover in the greenhouse or out-of-doors in mild climates.

africana: *S. europæa* var.

europæa. Very slender trailer: lvs. to ½ in. across, 7–9-lobed: fls. small, the 2 upper lobes of corolla yellowish, the 3 lower pink. Moist shady places, England, France, Spain, Portugal. Var. **africana** (*S. africana*) differs in being more hairy, in the slightly larger all yellow or purplish fls. Trop. Afr. Var. **variegata** has bright golden-green lvs.

SICANA. *Cucurbitaceæ.* Tendril-bearing monœcious American vines, probably more than a single species, per. but grown as an ann. in this country for its ornamental fragrant fr. which is also edible: fls. solitary, yellowish, corolla 1 in. or less long.

odorifera. CURUBA. CASSABANANA. To 40 ft. and more: lvs. nearly orbicular and several-angled or -lobed, to 1 ft. across: fr. long-oblong and nearly cylindrical, to 2 ft. long, orange-crimson and scented. S. Amer.—Somewhat grown in the Gulf regions. *Benincasa hispida* is sometimes confused with Cassabanana.

SICYOS. *Cucurbitaceæ.* Ann. tendril-bearing monœcious vines of Amer. and Australasia, one of which is sometimes grown as a screen: fls. small, white or greenish, mostly in fascicles: fr. small, indehiscent, usually spiny.

angulatus. BUR- or STAR-CUCUMBER. To 20 ft. or more, with hairy petioles and peduncles: lvs. cordate-orbicular, sharply angled or lobed: fr. about ½ in. long, spiny, 1-seeded, in clusters. E. Canada and U. S.—Likely to become a weed.

SIDALCEA. *Malvaceæ.* Herbs native in W. N. Amer. (ours per.) with alternate palmately lobed or divided lvs., purple, pink or white fls. in terminal spikes or racemes, and 5 or more carpels separating at maturity. Of easy cult. in the per. border. Propagated by seeds or division. Garden hybrids are reported.

candida. Per. to 3 ft., nearly or quite glabrous: radical lvs. broad and crenate or bluntly lobed, upper lvs. 5–7-parted: fls. white, to ¾ in. long, in racemes. Rocky Mts.

malvæflora. CHECKERBLOOM. Per. to 2 ft. with erect or somewhat decumbent branches: lower lvs. crenate or lobed, upper ones cleft into very narrow parts: fls. rose, to 1¼ in. long, in many-fld. racemes. Calif. Var. **atropurpurea** has purple fls. and **Listeri** satiny pink fls.

Murrayana: *S. spicata.*

nervata. Erect per. to 3 ft., glabrous or nearly so: basal lvs. orbicular and 6–8-lobed, upper ones cleft into linear parts: fls. rose, to 1½ in. across, in terminal racemes. Wyo., Utah.—Plants cult. as *S. malvæflora* may belong here, also the form known as Rosy Gem.

oregana. Per. to 5 ft., pubescent: lower lvs. toothed or slightly lobed, upper cleft into lanceolate or linear parts: fls. rose-pink, ½ in. long, in dense spikes. Ore. to Calif.

parviflora. Per. to 4 ft., glabrous to somewhat pubescent: lvs. palmately toothed or divided: fls. rose, ½ in. long, in long slender racemes. S. Calif.—Probably not now in cult.

spicata (*S. Murrayana*). Per. to 4 ft., pubescent or hirsute: lvs. crenately lobed to parted: fls. purplish, ½ in. long, in dense spikes. Calif.

SIDERITIS. *Labiatæ.* Herbs or shrubs with entire or toothed lvs. and small yellowish 2-lipped fls. in clusters or spikes; native in Medit. region and Asia; sometimes grown in per. border.

eubœa. White-tomentose: lvs. oblong: fls. in cylindrical spikes. Greece.

hyssopifolia. To 8 in., subshrubby: lvs. oblong, usually hairy: fls. with 5-toothed calyx. S. Eu.

SIDEROXYLON. *Sapotaceæ.* Trop. trees or shrubs, extending into S. Fla., with alternate leathery lvs., small 5-lobed fls. in clusters and fr. a berry; one species cult. in S. Calif.

costatum: *S. novo-zelandicum.*

novo-zelandicum (*S. costatum*). Tree to 45 ft.: lvs. obovate, to 4 in. long, shining: fr. 1 in. long. New Zeal.

SIEVERSIA: *Geum.*

SIGMATOSTALIX. *Orchidaceæ.* Low herbs native in the Andes, with small 1–2-lvd. pseudobulbs and small fls. in racemes or panicles, the sepals and petals similar, the lip with long claw. See *Orchids* for cult.

radicans. Lvs. to 7 in. long and ⅛ in. wide: fls. in 10–15-fld. nodding racemes; sepals and petals white; lip yellow, July–Sept. Brazil.

SILENE. CATCHFLY. CAMPION. *Caryophyllaceæ.* Erect, tufted, decumbent or more or less climbing ann. and per. herbs with red, pink or white fls. in cymes or solitary blooming in the summer, a few well into autumn; of wide distribution over the world.

A few species are cultivated in rock-gardens and borders. The culture is very simple. If the seeds of the annual kinds are sown in the fall, much earlier bloom is secured the following spring. The perennials are increased by seeds, division or cuttings.

acaulis. CUSHION PINK. MOSS CAMPION. Moss-like tufted per. to 2 in. high: lvs. linear, to ½ in. long: fls. reddish-purple, ½ in. across, solitary, May–Aug.; petals entire or slightly notched. Eu., N. Amer. Var. **alba** has white fls.

alba (*S. nivea*). Per. to 3 ft.: lvs. lanceolate, to 5 in. long: fls. white, yellowish beneath, ¾ in. across, few or solitary, June–July; petals 2-lobed; calyx inflated. Pa. to Neb.

alpestris. ALPINE CATCHFLY. Per. to 6 in., more or less sticky: lvs. linear-lanceolate: fls. glistening white, about ½ in. across, in panicles, June–Aug.; petals 4-lobed. Mts. of Eu. Var. **flore-pleno** has double fls.

antirrhina. Ann. to 2½ ft.: lvs. oblanceolate, to 2 in. long: fls. pink, ⅙ in. across, in loose panicles. N. Amer.—A weedy plant.

Armeria. SWEET WILLIAM CATCHFLY. Ann., erect, to 2 ft., glaucous: lvs. ovate-lanceolate, to 3 in. long: fls. pink or rose, to ⅔ in. across, in terminal compound cymes, July–Sept.; petals slightly lobed at tip. S. Eu.; escaped in U. S. Var. **alba** has white fls.

Asterias. Per. to 4 ft., rather sticky: lvs. lanceolate to oblong, 4–5 in. long: fls. purple, in many-fld. head-like cymes 1 in. across; calyx reddish; petals entire. Macedonia, Rumania. Var. **grandiflora,** to 3 ft., fls. crimson-scarlet, in globose heads, July–Aug. Balkan Mts.

Behen. Ann. to 1½ ft.: lvs. obovate: fls. pink, very small, in cymes. Asia Minor.

Bergeri: *S. regia.*

Bonnettii: *S. pendula* var.

californica. Per. to 1 ft.: lvs. ovate or oblanceolate, to 3½ in. long: fls. crimson, to 1¼ in. across; petals deeply 4-lobed. Calif., Ore.

Campanula. Per. to 8 in.: lvs. linear-lanceolate: fls. white tinged red beneath, ½ in. long, solitary or in 2's; petals 2-parted. Mts. of S. Eu.

caramanica. Per. to 1½ ft.: lvs. linear-lanceolate: fls. large, solitary, July; petals 2-parted. Asia Minor.

caroliniana (*S. pennsylvanica*). WILD PINK. Per. to 10 in., sticky-hairy: lvs. spatulate or lanceolate, to 4 in. long: fls. rose or white, 1 in. across, in terminal cymes, Apr.–June; petals notched. E. N. Amer.

chloræfolia. Per. to 2 ft., woody at base: lvs. elliptic, about 1 in. long, the upper cordate: fls. white turning reddish, large, in loose panicled cymes, May–June; petals 2-lobed. W. Asia.

chlorantha. Erect per.: lvs. oblong-lanceolate: fls. greenish-yellow, nodding, in panicles; petals 2-parted. Asia Minor.

compacta (*S. orientalis*). Bien. to 2 ft., glaucous: lvs. ovate to oblong-lanceolate, to 2 in. long: fls. pink, in dense sessile heads to 3 in. across, the upper lvs. forming an involucre, July; petals entire. E. Eu., Asia Minor.

conoidea. Ann. to 1 ft.: lvs. lanceolate: fls. pink, small, in cymes; petals entire or slightly notched. S. Eu. to W. Asia.

Cucubalus (*S. venosa*). BLADDER CAMPION. Per. to 3 ft.: lvs. ovate to lanceolate: fls. white, in loose panicles; petals 2-lobed; calyx inflated. Eu., Asia.

dichotoma. Branching pubescent ann. or bien. to 2 ft.: lvs. lanceolate, to 3 in. long: fls. white, to ½ in. across, sessile, in many-fld. paired racemes, summer; petals 2-parted to middle or more. Eu.; nat. in N. Amer.

Drummondii of the trade lists may be *S. Scouleri.*

elegans. To 8 in.: lvs. linear-lanceolate, to 2 in. long: fls. usually in 2's; petals 2-lobed. Portugal.

Fabaria. Erect, to 3 ft.: lvs. fleshy, obovate to elliptic-lanceolate: fls. in branching cymes, June; petals 2-parted to base. Asia Minor.

flavescens. Tufted per. to 8 in., yellow-pubescent: lvs. lanceolate: fls. bright yellow, large, solitary or in 2's; petals 2-parted. S. E. Eu.

Fortunei. Per. to 3 ft., woody at base: lvs. linear-lanceolate: fls. rose or white, ½ in. or more across, the calyx-tube to 1 in. long, solitary or in short racemes, Sept.; petals 2-parted with cut lobes. China.

fruticulosa. Low per.: lvs. lanceolate: fls. whitish, solitary; petals 2-parted. Medit. region.

gigantea. Tall per.: lower lvs. tufted, obovate, tomentose: fls. white, in many-fld. panicles; petals 2-parted. S. E. Eu.

glauca. Ann. or bien. to 6 in.: lvs. lanceolate to linear: fls. small, usually in 2's; petals 2-lobed. Medit. region.

græca: *S. pendula.*

Hookeri. Per. to 5 in.: lvs. obovate, to 2 in. long: fls. white or pink, to 2 in. across, solitary, deeply 4-parted and fringed. Calif., Ore.

italica (*S. ocymoides*). Branching, hairy: lvs. oblong to linear: fls. white, in panicles, Apr.–July; petals 2-lobed. S. Eu., N. Afr.

laciniata. MEXICAN CAMPION. INDIAN PINK. Per. to 5 ft., with erect or decumbent much branched sts.: lvs. linear-lanceolate, to 6 in. long: fls. bright red, to ¾ in. across, terminal and solitary; petals deeply 4-lobed. Mex., S. Calif. Var. **Purpusii** is dwarf with cardinal-red fls.

laeta. Ann. to 1 ft.: lvs. lanceolate: fls. rose, rather small, in few-fld. cymes; petals notched. Medit. region.

Lerchenfeldiana. Low tufted per., glaucous: lvs. lanceolate or oblong: fls. rose, in terminal cymes; petals slightly notched. S. E. Eu.

maritima. Per. to 1 ft. or more, glaucous: lvs. lanceolate or ovate-lanceolate: fls. 1–4 on a st., white, about ¾ in. across; petals 2-lobed; calyx much inflated. Eu. Var. **plena** has larger very double fls. about 1¼ in. across.

monachorum: *S. quadrifida.*

multicaulis. Per. to 1 ft., branched: lvs. linear-lanceolate, to 1 in. long: fls. whitish and green beneath or pink and brownish beneath, in cymes; petals 2-parted. Medit. region.

muscipula. Ann. to 2 ft.: lvs. lanceolate: fls. rose, in loose cymes; petals notched. Medit. region.

nivea: *S. alba.*

noctiflora. Ann. to 2 ft.: lvs. oblong-lanceolate: fls. pink or nearly white, opening at night, in few-fld. panicles; petals 2-parted. Eu.

nutans. Per. to 3 ft.: lvs. oblong-obovate: fls. white or greenish, nodding, in loose panicles; petals deeply 2-lobed. Eu.

ocymoides: *S. italica.*

orientalis: *S. compacta.*

Otites. Per. to 1 ft.: lvs. spatulate to linear: fls. diœcious, yellowish-green, small, in panicles, May–July; petals entire. Eu., Asia.

paradoxa. Much branched, woody at base: lvs. oblong to linear, white-ciliate: fls. in panicles; petals deeply 2-lobed. S. Eu.

pendula (*S. græca. S. rosea*). Ann. to 10 in., soft-hairy, sts. decumbent at base, branched above: lvs. ovate-lanceolate: fls. flesh-colored, about ½ in. across, in loose axillary racemes, becoming pendulous; petals 2-parted. Medit. region. Var. **alba,** fls. white. Var. **Bonnettii,** sts. brown-red, fls. purplish, shiny. Var. **compacta,** of compact habit.

pennsylvanica: *S. caroliniana.*

petræa: *S. Saxifraga.*

Pseudo-Atocion. St. branched at base, nearly or quite erect, 4–15 in., glandular-pubescent: lower lvs. spatulate, narrowed into ciliate base; upper ovate-lanceolate, acute, ciliate: fls. ½–1 in. across; calyx long-tubular; petals rose, obovate and entire. Balearic Isls. and Algeria.

Pseudo-Otites: a form of *S. Otites.*

pulchella: hort. name.

Pumilio. Tufted per. to 3 in.: lvs. linear: fls. rose, 1½ in. across, solitary, June; petals entire. Austrian Alps.

pusilla. Tufted low per.: lvs. spatulate: fls. white, solitary or in 2's; petals 4-toothed. S. Eu.

quadrifida (*S. monachorum*). Per. to 4 in., with slender rather sticky sts.: lvs. spatulate to linear: fls. white, solitary or in 3's; petals 4-lobed. S. Eu.

regia (*S. Bergeri*). ROYAL CATCHFLY Per. to 4½ ft., somewhat sticky and rough-hairy: lvs. thick, ovate-lanceolate, to 3 in. long: fls. numerous, deep scarlet, 1 in. across, in narrow panicles, July; petals notched or cut. Ohio to Ala. and Mo.

Reichenbachii. Tufted per. to 4 in., woody at base: lvs. oblanceolate to linear, ciliate: fls. white, in raceme-like nodding panicles; petals 2-parted. Dalmatia.

reticulata. St. erect, branched at base, to 1½ ft., glabrous but sticky: lower lvs. spatulate-lanceolate, attenuate into petiole; upper linear: fls. ½–¾ in. across; pedicels shorter than calyx which is tubular-clavate; petals rose, deeply emarginate. Algeria.

rosea: *S. pendula.*

rubella. Erect, branching: lvs. ovate-oblong to linear: fls. rose, small; petals notched. Medit. region.

rupestris. Per. to 8 in.: lvs. lanceolate: fls. pale pink, in cymes; petals 2-lobed. Eu.

Saponaria: *Saponaria officinalis.*

Saxifraga (*S. petræa*). Tufted per. to 10 in., woody at base: lvs. linear or linear-lanceolate: fls. whitish, in 2–3-fld. cymes or solitary; petals 2-parted. Eu., Asia Minor.

Schafta. MOSS CAMPION. Soft-hairy per. to 6 in., simple or slightly branched: lvs. oblanceolate, small, in rosettes: fls. rose or purple, 1 or 2 on a st., axillary or terminal; petals notched. Caucasus.

Scouleri. Sticky-hairy per. to 2½ ft.: lvs. lanceolate: fls. white or purplish, in whorled spikes, July–Aug.; petals 2-parted. Ore. to Vancouver Isl.

squamigera. Ann. to 1½ ft.: lvs. oblong to linear: fls. white, in panicles; petals 2-lobed. Asia Minor.

stellata. STARRY CAMPION. Per. to 3 ft., erect, branched, rough-pubescent: lvs. mostly in whorls of 4, ovate-lanceolate, to 4 in. long: fls. white, to ¾ in. across, nodding in an open panicle, June–Aug.; petals fringed. Woods, Mass. to Ga. and Tex.

tatarica. Per., sts. densely leafy: lvs. linear-oblong: fls. white, in loose raceme-like panicles; petals 2-parted. E. Eu., W. Asia.

vallesia. Per. to 4 in., tufted, sticky-pubescent: lvs. spatulate or lanceolate: fls. rose-violet, greenish beneath, the petals 2-parted. Alps.

venosa: *S. Cucubalus.*

virginica. FIRE PINK. Per. to 2 ft., sticky-hairy: lvs. oblanceolate, to 5 in. long: fls. 1 in. or more across, crimson or scarlet, in loose cymes, more or less nodding, May–Sept.; petals cut or notched. N. Y. to Ga. and Ark.

viridiflora. Per. to 2 ft., sticky-pubescent: lvs. ovate-oblong: fls. greenish-white, nodding, in long loose panicles; petals 2-parted. S. Eu.

Wherryi. Allied to *S. caroliniana* but differing in calyx the same length as claws of petals and densely covered with whitish hairs, and styles about length of ovary. Ohio to Ala.

Zawadskii. Per. to 8 in.: lvs. lanceolate: fls. white, in few-fld. racemes; petals 2-parted. Austria.

SILICLE: the short broad fruit of certain *Cruciferæ.*

SILIQUE: the long fruit of certain *Cruciferæ.*

SILK-COTTON-TREE: *Ceiba pentandra.* **-Plant,** Chinese: *Bœhmeria nivea.* **-tassel Bush**: *Garrya.* **-Tree**: *Albizzia Julibrissin.* **-Vine**: *Periploca.*

SILKWEED: *Asclepias.*

SILKY: a covering of soft appressed fine hairs; sericeous.

SILPHIUM. ROSINWEED. *Compositæ.* Tall hardy coarse herbaceous perennials with sunflower-like heads of yellow ray- and disk-fls.; pappus none or of awns; native in N. Amer. Differs from Helianthus in bearing sterile disk-fls. and in other technical characters.

Silphiums thrive in any good soil and in full sunlight. They are useful for rear borders. Propagated by seed or division.

integrifolium. To 5 ft.: lvs. ovate or ovate-lanceolate, to 5 in. long, entire or slightly toothed, sessile: heads to 2 in. across, Aug.–Sept. Ohio to Tex.

laciniatum. COMPASS-PLANT. To 12 ft., rough: lvs. 1 ft. or more long, 1–2-pinnate, the upper clasping: heads to 5 in. across, July–Sept. Ohio to Tex.

perfoliatum. CUP-PLANT. INDIAN CUP. To 8 ft., st. square: lvs. ovate, to 1 ft. long, upper connate-perfoliate: heads to 3 in. across, July–Sept. Ont. to Ga. and La.

terebinthinaceum. PRAIRIE DOCK. To 10 ft.: lvs. mostly basal, ovate-cordate, to 1 ft. long, toothed to pinnatifid, long-stalked: heads to 3 in. across, July–Sept. Ont. to Ga. and La.

trifoliatum. To 7 ft.: lvs. lanceolate, to 7 in. long, entire or toothed: heads to 2 in. across, July–Oct. Pa. to Va. and Ala.

SILVER-BELL: *Halesia.* **-Tree**: *Leucadendron argenteum.* **-Vine**: *Actinidia polygama.* **-Weed**: *Potentilla Anserina.*

SILVERBERRY: *Elæagnus argentea.*

SILVERROD: *Solidago bicolor.*

SILVERY: with a whitish metallic more or less shining luster.

SILYBUM. *Compositæ.* Thistle-like herbs from Eu., Afr. and Asia: lvs. with spiny-toothed lobes and conspicuously white-spotted above: heads large, purplish, solitary and terminal, of disk-fls.; pappus of bristles. Of simple cult.; increased by seed, blooming first year.

eburneum. Ann. or bien. differing from *S. Marianum* in the outer bracts of involucre erect and with very short spiny point. N. Afr.—This plant has been listed as *Carduus arabicus.*

Marianum (*Carduus Marianus*). ST. MARYS, BLESSED, HOLY, or MILK THISTLE. Ann. or bien. to 4 ft.: lvs. to 2½ ft. long, undulate, glossy: heads to 2½ in. across, rose-purple, bracts of involucre with long spreading-reflexed spiny point. Medit. region; nat. in Calif.

SIMAROUBACEÆ. QUASSIA FAMILY. Trees and shrubs of about 30 genera mostly in trop. regions, known to cult. chiefly in the genus Ailanthus, and Quassia also planted for economic purposes. The family is characterized by mostly alternate pinnate lvs., small unisexual or bisexual fls. with 3–5 sepals and petals, as many or twice as many stamens, superior 2–5-celled or -parted ovary, and usually drupe-like fr. The family yields bitter qualities, insecticides, medicinal products, and dyes, but is known in N. Amer. chiefly by one species of Ailanthus.

SIMMONDSIA. *Buxaceæ.* One diœcious much branched boxwood-like stiff evergreen shrub to 7 ft. native in S. Calif., Ariz. and Mex. and sometimes planted in its region. **S. californica.** JAJOBA. GOAT-NUT. Lvs. opposite, oblong to ovate, 1½ in. long, entire: fls. small, apetalous: caps. to 1 in. long.

SINAPIS: *Brassica.*

SINGHARA-NUT: *Trapa bispinosa.*

SINNINGIA. *Gesneriaceæ.* Brazilian pubescent herbs with tuberous corm-like roots, opposite long-stalked lvs., large tubular 5-lobed fls. solitary or clustered, and capsular frs.; one species is the gloxinia of florists and greenhouse cult., with large richly colored fls.

Gloxinias require a warm humid atmosphere in the growing season, and protection from strong sun. After blooming the tubers should be stored in a temperature of about 45° until February when they may be started into growth again. Care should be exercised in watering not to wet the leaves. Propagated by seeds or by leaf-cuttings in a propagating bed; either method should produce flowering plants in about one year or perhaps less.

speciosa (*Gloxinia speciosa*). GLOXINIA. Nearly stemless: lvs. oblong or oblong-ovate, 6 in. or more long, toothed: fls. violet or purplish, varying to red and white or spotted, 3 in. and more long, bell-shaped. Var. **macrophylla** has large lvs. veined with white. Improved forms are advertised as *Gloxinia hybrida grandiflora* and *G. imperialis.*

SINOFRANCHETIA: see *Lardizabalaceæ.*

SINOMENIUM. *Menispermaceæ.* One woody vine from Japan and China. **S. acutum.** Lvs. ovate, to 6 in. long, entire or palmately 3–7-lobed, dark green above, slightly glaucous beneath: fls. small, in panicles to 10 in. long: fr. a bluish-black drupe. In var. **cinerascens** the lvs. are densely gray-pubescent beneath.—Not fully hardy in the N. Propagated by seeds and cuttings.

SINUS: a fold or re-entering angle; the space or recess between two lobes of a leaf or other expanded organ.

SIPHONANTHUS. *Verbenaceæ.* Distinguished from Clerodendrum (with which it is united by some authors) by the exceedingly long slender corolla-tube and unequal limb, fr. more or less fleshy or berry-like and accompanied by the enlarging often colored calyx.

indica (*Clerodendrum Siphonanthus*). Tubeflower. Turks-Turban. Striking erect shrub or woody herb to 8 ft., bearing terminal panicles of white fls. with tube to 4 in. long, closing in morning: lvs. mostly whorled, lance-oblong, to 5 in. or more, entire: fr. showy, red-purple persistent berry subtended by red-brown calyx. E. India; grown in Fla. and spontaneous.

SIRIS-TREE: *Albizzia Lebbek.*

SISSOO: *Dalbergia Sissoo.*

SISYMBRIUM: a generic name of the Cruciferæ variously defined, sometimes applied to the water-cress (Nasturtium); species not in cult.

SISYRINCHIUM. Blue-eyed Grass. *Iridaceæ.* American perennials with short rootstocks, grass-like tufted lvs. and small blue or yellow fls. in terminal umbels, the perianth-tube short or none. Of easy cult. in any garden soil, making attractive clumps. Propagated by seeds and division.

anceps: *S. angustifolium.*

angustifolium (*S. anceps*). To 2 ft.: fls. deep violet-blue, ½ in. long. N. Amer.

bellum. To 1½ ft.: fls. violet-purple, to ⅗ in. long. Calif.

Bermudiana. To 20 in.: fls. violet-blue, yellow at base, to ⅔ in. long. Bermuda.

boreale (*Hydastylus borealis*). To 1 ft., sts. broadly winged: fls. yellow, ⅓ in. long. B. C., Wash.

californicum (*Hydastylus californicus*). To 1 ft. or more, the sts. broadly winged: fls. bright yellow, to ½ in. long. Ore. to Calif.

grandiflorum. To 1 ft.: fls. reddish-purple or rarely white, to ¾ in. long. B. C. to Ida. and Calif.

iridifolium. To 1 ft.: fls. yellowish-white, ½ in. long. Brazil to Chile.

macrocephalum. To 2 ft.: fls. yellow, ½ in. long, segms. lacinate. Brazil, Uruguay.

pachyrhizum. To 2 ft., st. 2-edged: fls. yellow, ¼ in. long. Brazil.

striatum. To 3 ft.: fls. yellow, striped in center, to ¾ in. long. Chile, Argentina.

varians. To 1 ft.: fls. light blue, to ½ in. long. Okla. to Tex.

SITOLOBIUM: *Dennstaedtia cicutarium.*

SIUM. *Umbelliferæ.* Per. herbs with pinnately compound lvs., small white fls. in compound umbels, and ovate frs.; the second species grown for the edible roots.

Skirret does best in rich soil. Seed may be sown in fall or spring in drills and the seedlings thinned to 8 inches in the row. Roots may be dug and stored in sand over winter or left in the ground.

cicutæfolium. To 6 ft.: lvs. with 7–17 linear or lanceolate sharp-toothed lfts. N. Amer.

Sisarum. Skirret. To 3 ft., with clustered tuberous roots: lvs. with 3–7 lanceolate toothed lfts. E. Asia.

SKIMMIA. *Rutaceæ.* Evergreen shrubs native from the Himalayas to China and Japan, with alternate simple lvs., small white fls. in terminal panicles, and berry-like frs.; grown for ornament far S. but not hardy in the N., and sometimes grown under glass for the fragrant bloom.

Plants may be grown in pots in a mixture of sand, peat and loam, or set out in partly shaded situations. With the diœcious species, both pistillate and staminate plants should be provided to insure good fruit. Propagated by seeds or cuttings over heat.

Fortunei: *S. Reevesiana.*

fragrans: *S. japonica.*

japonica (*S. fragrans. S. oblata*). To 5 ft., polygamous or diœcious: frs. bright red. Japan.

oblata: *S. japonica.*

Reevesiana (*S. Fortunei*). To 2 ft.: fls. usually bisexual: fr. dull red. China. Var. **variegata** (*S. Fortunei* var. *argentea*) has lvs. bordered with white.

SKIRRET: *Sium Sisarum.*

SKULLCAP: *Scutellaria.*

SKUNK-CABBAGE: *Symplocarpus fœtidus.* Yellow: *Lysichitum.*

SKUNKWEED: *Navarretia squarrosa, Polemonium confertum.*

SKY-FLOWER: *Duranta repens.*

SLIPPER-FLOWER: *Pedilanthus tithymaloides.*

SLIPPERWORT: *Calceolaria.*

SLOE: *Prunus spinosa.*

SMILACINA (*Vagnera*). False Solomons-Seal. *Liliaceæ.* Per. herbs with rootstocks, having alternate usually sessile lvs., small white or greenish fls. in terminal racemes or panicles, the perianth-segms. distinct, and round red or greenish berries. Of easy cult. in moist partly shady places; useful for colonizing. Propagated by division.

amplexicaulis. To 3 ft.: lvs. ovate, to 6 in. long: fls. in panicles to 6 in. long: berries red spotted with purple. B. C. to New Mex.

bifolia: *Maianthemum bifolium.*

racemosa. To 3 ft.: lvs. to 6 in. long and 3 in. wide: fls. numerous, in panicles to 4 in. long: berries red. N. Amer.

sessilifolia. To 2 ft.: lvs. ovate-lanceolate, to 6 in. long: fls. few, in racemes to 2 in. long: berries dark purple. B. C. to Calif.

stellata. To 20 in.: lvs. to 5 in. long and 1½ in. wide: fls. several, in racemes to 2 in. long. N. Amer., Eu.

trifolia. To 15 in.: lvs. to 5 in. long and 2 in. wide: fls. few, in racemes to 2 in. long. N. Amer., Siberia.

SMILAX. Greenbrier. *Liliaceæ.* Mostly woody vines climbing by tendrils borne in pairs at the base of the petioles, the lower lvs. reduced to scales, the upper entire or lobed, with small unisexual fls. in axillary umbels, the perianth-segms. distinct, and fr. a berry; several species yield sarsaparilla and others are gathered for winter greens from the wild. They are sometimes transferred to wild-gardens, or colonized; sometimes the trop. species are seen in greenhouses. The smilax of florists is *Asparagus asparagoides.*

aspera. Lvs. evergreen, ovate to lanceolate, to 5 in. long, usually heart-shaped at base, commonly blotched with white: fr. red. S. Eu. to India.

glauca. Cat-Brier. Lvs. deciduous or partially evergreen, ovate, to 6 in. long, glaucous: fr. bluish-black. Dry soil, Mass. to Fla. and Tex.

herbacea. CARRION-FLOWER. Lvs. deciduous, ovate to lanceolate, to 5 in. long, obtuse or heart-shaped at base: fr. bluish-black. N. B. to Okla.

hispida. Lvs. deciduous, ovate, to 5 in. long, usually heart-shaped at base, rough-edged: fr. black. Conn. to N. C. and Tex.

lanceolata. Lvs. evergreen, lanceolate, to 3½ in. long, shining above: fr. dark red. Va. to Fla. and Tex.

laurifolia. FALSE CHINA-BRIER. Lvs. evergreen, oblong, to 5 in. long, glaucous beneath, wedge-shaped at base: fr. black. N. J. to Fla. and Tex.

officinalis. Lvs. ovate-oblong, heart-shaped, to 6 in. long, leathery, glabrous and shining. S. Amer.

rotundifolia. HORSE-BRIER. Lvs. deciduous, ovate to nearly orbicular, to 6 in. long, rounded or heart-shaped at base: fr. bluish-black. N. S. to Ga. and Tex.

Walteri. Lvs. deciduous, ovate or oblong, to 4½ in. long, mostly heart-shaped at base: fr. coral-red. N. J. to Fla. and La.

SMOKE-TREE: *Cotinus coggygria, Dalea spinosa.*

SMOOTH: said of surfaces that have no hairiness, roughness or pubescence, particularly of those not rough or scabrous.

SNAIL-FLOWER: *Phaseolus Caracalla.*

SNAILSEED: *Cocculus.*

SNAKE-HEAD: *Chelone glabra.*

SNAKEROOT, BLACK: *Cimicifuga racemosa.* **Button:** *Eryngium aquaticum, Liatris.* **Seneca:** *Polygala Senega.* **Virginia:** *Aristolochia Serpentaria.* **White:** *Eupatorium urticæfolium.*

SNAKES-HEAD: *Fritillaria meleagris.*

SNAKEWEED: *Polygonum Bistorta.*

SNAKEWOOD TREE: *Cecropia palmata.*

SNAPDRAGON: *Antirrhinum.*

SNAPWEED: *Impatiens.*

SNEEZEWEED: *Helenium.*

SNEEZEWORT: *Achillea Ptarmica.*

SNOWBALL: *Viburnum.*

SNOWBERRY: *Chiococca, Symphoricarpos albus.* **Creeping:** *Chiogenes hispidula.*

SNOW-BUSH: *Breynia nivosa.* **-in-Summer:** *Cerastium tomentosum.* **-on-the-Mountain:** *Euphorbia marginata.* **-Wreath:** *Neviusia alabamensis.*

SNOWDROP: *Galanthus.* **-Tree:** *Halesia.*

SNOWFLAKE: *Leucojum.* **Water:** *Nymphoides indicum.*

SOAP-BARK TREE: *Quillaja Saponaria.* **-Plant:** *Chlorogalum pomeridianum.*

SOAPBERRY: *Sapindus.*

SOAPWORT: *Saponaria.*

SOBOLE: sucker, — ground-shoot.

SOBOLIFEROUS: bearing shoots from the ground; sometimes said of palms and other tree-like plants producing two or more trunks that arise in the nature of suckers, forming something like a set or cluster of stems in distinction from a single stem or trunk.

SOBRALIA. *Orchidaceæ.* Terrestrial trop. American reed-like orchids with leafy sts. and fls. solitary or in terminal racemes, the sepals and petals spreading, the lip overlapping around column and forming a tube with expanding limb. Treated much like Cœlogyne. See *Orchids.*

leucoxantha. Sts. to 3 ft. high: lvs. to 6 in. long: fls. snow-white with golden-yellow throat marked with orange, to 4 in. long, solitary, July–Aug. Costa Rica, Guatemala.

macrantha. Sts. to 7 ft. high: lvs. to 10 in. long: fls. violet with yellow throat, wavy, 6 in. across, solitary, Apr.–Aug. Mex., Guatemala. Var. **Kienastiana** (var. *alba*) has white fls.

virginalis. Sts. to 3 ft. high: lvs. to 6 in. long and 1½ in. wide: fls. white with yellow throat, wavy, 3½ in. long, solitary. Colombia.

xantholeuca. Sts. to 3 ft. high: lvs. to 7 in. long: fls. lemon-yellow shaded deeper on wavy lip, to 5 in. long, solitary, July–Aug. Guatemala.

SOILS. The usual treatment of soils requires no description here. There are many available books and bulletins. Experience in choice and handling of land for orchards and vegetable-gardens is now extensive for practically all parts of the country; and while there is much need of additional investigation, the subject is one for special technical discussion. But we now know that the soil reaction as to alkalinity or acidity is an important factor in the successful rearing of many ornamental plants with which the recorded experience is not extensive or sufficient, and this factor may be discussed, as at present understood.

Tillage and fertilizing, together with sufficient drainage, are fundamental or primary requirements in the effective rearing of plants. Tillage has many and far-reaching results aside from destroying weeds and facilitating planting. It provides good root-hold if deep enough and it extends the feeding area at the same time that it renders soil nutrients more available. The frequently shallow-tilled surface conserves moisture by preventing evaporation in open lands; but when land is covered with a crop and therefore closely occupied by roots the moisture may be transpired through the plants before it reaches the upper layers, yet even in this case tillage of closely-rowed crops is useful in eliminating weeds and in keeping the land fit.

The recent subject of alkalinity and acidity has been discussed for ornamental plants by Dr. Edgar T. Wherry of the Bureau of Chemistry of the United States Department of Agriculture in Bulletin 4 of the American Horticultural Society, 1926, and acid-soil gardening in Better Homes and Gardens, April, 1930; from these publications the remainder of this article is assembled, with his aid. If the gardener wishes to make his own tests of soil acidity and alkalinity, he should apply to his state or provincial experiment station for the latest methods.

Acid-soil gardening

"In recent years it has come to be recognized that certain species of plants, including some of the most highly prized ornamental shrubs, are favored by acids in the soil and injured or killed by alkaline materials, such as lime and manure. There has arisen, accordingly, a new type of horticulture, which may be termed, for short, acid-soil gardening.

"Do many sorts of plants require a high degree of acidity in their soils and so fit into this new type of garden? Yes, it may be said that the number is rather large. On scanning the catalog of a well-known eastern nursery, some 225 native American species were found to be included, and of these, 80, or more than one-third, represent plants which field observations have shown to prefer acid-soil conditions. Evidently, therefore, no one who goes in for the cultivation of our own American ornamentals can afford to ignore soil acidity.

"A list of these acid-loving plants may be of interest here. Among the broadleaf evergreens there are galax, mountain-laurel (Kalmia), sandmyrtle (Leiophyllum), leucothoe, andromeda, rhododendron, and oconee-bells (Shortia). The deciduous shrubs of like soil preference include shadbush, chokeberry, azaleas of all kinds, fringetree, clethra, flowering dogwood, huckleberry, silverbell, staggerbush, rhodora, American mountain-ash, blueberry, withe-rod, and yellowroot. Even some of the hardy herbaceous perennials belong in the acid class, as for instance, yellow wild-indigo, pink turtlehead, lily-of-the-valley, rose coreopsis, fringed bleedingheart, trailing-arbutus, bluets, some lilies, mountain phlox, and painted trillium.

"Perhaps the gardener has tried to grow some of these plants and they have dwindled and died in spite of all the care lavished on them. The reason has probably been that the soil was not sufficiently acid. Set aside a part of your garden as a special acid-soil bed and try again. Unless the climatic conditions are extremely unfavorable one will find that such plants can be successfully cultivated far from their native haunts in the woodlands."

The appearance of moss or of sorrel on a plot of ground is commonly supposed to indicate that the soil has become acid, but such is not necessarily the case, and actual tests as to reaction should always be made. There are simple outfits for the testing of the soil in respect to acid and alkaline reaction, the determinator being a dye that changes color one way or another. Directions come with the outfit and persons without experience are able to operate it.

Acid-soil beds are readily prepared. The earthworm brings up lime from the subsoil and mixes it with the upper layers, thus often neutralizing an acid plot. It is supposed that leaf-mold, humus and peat are acidifying materials, but "chemical examinations of hundreds of samples of these substances have shown that in the majority of cases they are neutral, or nearly so, and quite unsuited to this purpose. Peat moss derived from the disintegration of sphagnum moss can usually be depended upon to be strongly acid. So also can the upland peat which accumulates under pine, spruce, and hemlock trees, or under rhododendron, mountain-laurel, and blueberry bushes; or, lacking these, crumbling tree-bark, rotted wood, and well-weathered sawdust may be used. To be on the safe side, however, tests should invariably be made with soil testers, and no material which does not show a color corresponding to a high degree of acidity should be used to fill in the beds."

"Most acid-soil plants prefer a porous, open-textured soil, which can best be obtained by mixing with the organic substance just enumerated a considerable volume of sand as free as practicable from clay and from lime. White sand from a pine-barren or bank sand is particularly desirable, but river sand, such as used in cement work, is usually satisfactory.

"In case it is inconvenient to prepare a special acid-soil bed by digging out and refilling, treatment of the native soil with acidifying agents may be used and often gives good results. If a heavy mulch of any of the strongly acid organic materials already discussed is spread over the bed, rain or sprinkling-water will leach more or less acid from them and gradually carry it down to the plant roots. Fresh leaves of oak and various other trees yield a certain amount of acid and may be used for mulching, but when they become soggy, black, and rotted, they lose their acidity and must be renewed.

"Acidifying chemicals may also be used, especially when quick results are desired, although they must be applied cautiously. One of the most desirable chemicals is commercial tannic acid, which costs around 10 cents a pound. It may be scattered over the surface of the ground, then dissolved by soaking the bed thoroughly. Another substance which has found favor for use in the same manner is crude aluminum sulfate, which is even cheaper. It is extensively used for clearing water and can be conveniently obtained thru a local waterworks or from any dealer in heavy chemicals. Also, applications should never be made to mixed plantings, because the increase in acidity which would help an azalea, for instance, would be fatal to a nearby lilac bush.

"The amounts of these chemicals to be applied varies greatly with the conditions. In soils which are sandy, sterile, and moderately acid at the start, 4 ounces of acidifying agent a square yard may be sufficient to develop high acidity. Average neutral garden loams require 1 pound, whereas in limestone regions as much as 5 pounds to the same area may be necessary. In all cases it is desirable to wait a few weeks after making an application to give the acidifying substance time to mix thoroughly with the soil; then repeat the test on another sample from root level. If the desired degree of acidity proves not to have been obtained, the treatment can then be made again and again until the acid-tester shows proper reaction.

"Even when a bed has been made acid enough for satisfactory growth of plants, it is not safe to assume that it will remain so indefinitely. The indicator tests should be made once or twice each year, and if high acidity is not being maintained, the application of acidifiers should be repeated."

Lists of plants requiring acid or neutral soil reactions (*Wherry*)

Reaction tests of habitats and soils of horticultural interest have yielded the following results:

Superacid....... Peat bogs in which the chief plant is sphagnum moss.

Mediacid	Various kinds of peat bogs. Swamps where the water is lacking in calcium bicarbonate. Thickets of rhododendron, kalmia, and other ericaceous plants. Woods where such plants as hemlock, pine, spruce, or oak are dominant. Accumulations of upland peat, rotting wood, and similar materials. Mountain peaks and sandhills where the substrata are non-calcareous.
Subacid	Many sorts of marshes, meadows, swamps, and upland woods. Long-abandoned fields and gardens in non-calcareous regions.
Minimacid	Humus - rich meadows, swamps, and woods in calcareous regions. Fields and gardens under standard types of cultivation.
Circumneutral	Soils in which neither acid or alkaline influences are markedly dominant.

The soils of southern Europe and the Mediterranean region generally, where so many of the old garden plants are native, show largely circumneutral reactions. Plants thriving in such soil conditions may be mentioned first.

1. Requiring Circumneutral Soils

Abelia
Acer (many species)
Actæa
Adiantum
Æsculus
Alyssum
Ampelopsis
Amygdalus (Prunus)
Anemone
Apium graveolens
Asparagus
Aster (many species)
Astilbe
Begonia
Berberis
Beta vulgaris
Brassica oleracea
Bromus
Buddleja
Buxus sempervirens
Calendula officinalis
Callicarpa
Callistephus chinensis
Campanula (many species)
Canna indica
Celastrus
Chrysanthemum
Clematis
Coleus Blumei
Convolvulus
Coreopsis (many species)
Cosmos bipinnatus
Cotoneaster
Cratægus
Crocus
Cucumis
Cucurbita
Dahlia
Daucus Carota
Delphinium (many species)
Deutzia
Dianthus
Euonymus
Fagus
Forsythia
Fraxinus
Gladiolus
Hedera
Helianthus
Hibiscus
Hyacinthus orientalis
Hydrangea (many species)
Iris (many species)
Juniperus
Lactuca sativa
Lespedeza
Ligustrum
Lonicera
Lychnis
Lycopersicon esculentum
Malus (Pyrus)
Medicago sativa
Melilotus
Mertensia virginica
Narcissus
Œnothera
Pæonia
Papaver
Pastinaca sativa
Pelargonium
Phaseolus (many species)
Philadelphus
Phlox paniculata
Pisum sativum
Poa
Polygonum
Primula
Prunus
Pyrus
Ranunculus
Rhamnus
Ribes
Rosa
Secale cereale
Spinacia oleracea
Spiræa (many species)
Syringa
Taxodium distichum
Taxus
Thuja
Trifolium (many species)
Triticum æstivum
Tulipa
Ulmus
Viola (many species)
Vitis (many species)
Wisteria
Yucca
Zea Mays
Zinnia

2. Plants Apparently Preferring Mediacid Soils

(Mostly growing also in superacid and in subacid soils.)

Andromeda
Arenaria grœnlandica
Arethusa bulbosa
Arnica
Asarum Shuttleworthii
Asclepias rubra
Asplenium montanum
        pinnatifidum
Calla palustris
Calopogon pulchellus
Chamæcyparis thyoides
Clintonia borealis
Coptis trifolia
Corema Conradi
Cornus canadensis
Cypripedium acaule
Darlingtonia californica
Dionæa muscipula
Drosera
Empetrum nigrum
Epigæa repens
Galax aphylla
Habenaria blephariglottis
        cristata
        orbiculata
Helonias bullata
Iris prismatica
    verna
Kalmia polifolia
Ledum grœnlandicum
Leiophyllum
Lilium Catesbæi
Linnæa borealis var. americana
Loiseleuria procumbens
Lygodium palmatum
Magnolia glauca
Menziesia pilosa
Molinia cœrulea
Paronychia argyrocoma
Pieris
Pogonia divaricata
        ophioglossoides

Polypodium aureum
Potentilla tridentata
Quercus ilicifolia
Rhexia
Sarracenia
Sorbus americana
Stenanthium robustum
Streptopus roseus
Trientalis americana
Trillium undulatum
Vaccinium Vitis-Idæa var. minor
Woodwardia areolata
Xerophyllum asphodeloides

3. Plants Apparently Preferring Subacid Soils

(Mostly growing also in mediacid and in high-minimacid soils.)

Abies
Acer pennsylvanicum
    spicatum
Agrostis capillaris
    stolonifera
Aletris farinosa
Aleurites Fordii
Anaphalis margaritacea
Antennaria dioica
Arachis hypogæa
Aronia
Asarum virginicum
Aster linariifolius
    macrophyllus
    patens
    spectabilis
Athyrium Filix-femina
Azalea
Baptisia tinctoria
Betula lenta
Botrychium dissectum
    matricariæfolium
    obliquum
Calluna vulgaris
Campanula divaricata
Carex Fraseri
Castanea dentata
    pumila
Ceanothus americanus
Chamædaphne calyculata
Chamælirium luteum
Cheilanthes lanosa
Chelone Lyoni
    obliqua
Chimaphila
Chionanthus virginica
Cimicifuga americana
Claytonia caroliniana
Clematis crispa
Clethra
Clintonia umbellulata
Clitoria mariana
Comptonia asplenifolia
Convallaria majalis
Coreopsis major
    pubescens
    rosea
    verticillata
Corydalis sempervirens
Cunila mariana
Cypripedium arietinum
Cytisus scoparius
Dalibarda repens
Dennstaedtia punctilobula
Dentaria diphylla
Dicentra eximia
Diphylleia cymosa
Disporum lanuginosum
Dryopteris Boottii
    Clintoniana
    dilatata (americana)
Epipactis (Goodyera) pubescens
    repens (ophioides)
    tesselata
Erica
Eryngium aquaticum
Eupatorium aromaticum
Fothergilla Gardeni
Franklinia alatamaha
Galium boreale
Gaultheria procumbens
Gaylussacia
Gelsemium sempervirens
Gordonia lasianthus
Habenaria bracteata
    ciliaris
    fimbriata
    Hookeri
    lacera
    obtusata
    peramœna
Halesia tetraptera
Heuchera villosa
Houstonia serpyllifolia
Hypoxis hirsuta
Ilex Cassine
    glabra
    opaca
Iris carolina
    Kaempferi
    tenax
Juniperus communis montana
    horizontalis
Kalmia angustifolia
    latifolia
Krigia montana
Leucothoe
Liatris graminifolia
    squarrosa
Lilium carolinianum
    Grayi
    philadelphicum
    superbum
Listera cordata
Lupinus perennis
Lycopodium clavatum
    complanatum (flabelliforme)
    lucidulum
    obscurum
Lyonia ligustrina
Magnolia (excepting M. glauca)
Maianthemum bifolium
    canadense
Medeola virginica
Melanthium virginicum
Menyanthes trifoliata
Mitchella repens

Mitella nuda
Monotropa uniflora
Myrica
Nemopanthus mucronatus
Œnothera glauca
Opuntia compressa
Oxalis Acetosella (montana)
Parnassia asarifolia
Paronychia dichotoma
Phlox amœna
  ovata
  stolonifera
Picea
Pinus, many though not all species
Polygala paucifolia
Pteridium aquilinum (latiusculum)
Pyrola
Quercus Catesbæi
  falcata
  marilandica
  Phellos
  stellata
Rhododendron
Rhodora canadensis
Rubus hispidus
  idæus
Salix repens
Sedum anglicum
Shortia galacifolia
Smilax laurifolia
  Walteri
Solanum tuberosum
Solidago bicolor
  odora (suaveolens)
Spiraea tomentosa
Spiranthes gracilis
  odorata
Stellaria Holostea
Stewartia pentagyna
Styrax americana
Tradescantia rosea
Trilisa odoratissima
Tsuga caroliniana
Ulex europæus
Vaccinium
Veronica spicata
Viburnum alnifolium
  nudum
Viola pedata
  pedata lineariloba
Woodsia ilvensis
Zenobia pulverulenta
Zephyranthes Atamasco
Zygadenus

4. Plants Apparently Preferring Minimacid Soils

(Mostly growing also in subacid, but not thriving in alkaline soils, in this respect differing from circumneutral-soil plants, which class comprises most garden plants.)

Acanthus mollis
Adlumia fungosa
Æsculus Pavia
Agrostis palustris (alba)
Allium Schœnoprasum
Amelanchier
Apocynum androsæmifolium
Aquilegia cærulea
  cærulea hybrida
  chrysantha
Aralia hispida
  spinosa
Aster undulatus
Avena sativa
Brassica Rapa
Calypso bulbosa
Cardamine pratensis
Cerastium arvense
Cheilanthes tomentosa
Chrysogonum virginianum
Chrysopsis mariana
Citrullus vulgaris
Coreopsis, many species
Cornus florida
Corylus rostrata
Delphinium nudicaule
Dryopteris intermedia
  Linnæana
  spinulosa
Epilobium angustifolium
Filipendula hexapetala
Garcinia Mangostana
Gillenia trifoliata
Helianthemum Chamæcistus
Houstonia cærulea
Iberis sempervirens
Linum usitatissimum
Litchi chinensis
Lonicera Periclymenum
Lotus corniculatus
Lupinus hirsutus
Miscanthus sinensis
Monarda didyma
Ophioglossum vulgatum
Orchis rotundifolia
Phaseolus lunatus macrocarpus
Rubus occidentalis
Rumex scutatus
Selaginella rupestris
Silene orientalis
  pennsylvanica
Stizolobium Deeringianum
Symplocos tinctoria
Trillium stylosum
Vigna sinensis, some varieties

SOJA: *Glycine Max.*

SOLANACEÆ. Nightshade Family. More than 75 genera of wide distribution comprising herbs, shrubs, vines and trees, with usually alternate entire to pinnate lvs., bisexual fls. with 5-lobed calyx and gamopetalous corolla, the latter commonly wheel-shaped, 5 stamens of which 1 or more may be sterile, superior mostly 2-celled ovary and fr. a berry or caps. The family abounds in medicinal and poisonous properties and the potato, tomato, eggplant, red-pepper, tobacco and others are of great economic importance. Genera herein treated are Atropa, Browallia, Brunfelsia, Capsicum, Cestrum, Cyphomandra, Datura, Fabiana, Grabowskia, Hyoscyamus, Iochroma, Lycium, Lycopersicon, Mandragora, Nicandra, Nicotiana, Nierembergia, Petunia, Physalis, Quincula, Salpichroa, Salpiglossis, Schizanthus, Solandra, Solanum, Streptosolen.

SOLANDRA. CHALICE-VINE. *Solanaceæ.* Tall woody plants, erect or climbing, glabrous or pubescent, sometimes grown in warm greenhouses and frequent in the open in S. U. S. and Calif. for the large, showy, winter-blooming, tubular, white, creamy, or yellow, solitary fls. and the leathery entire lvs., and berry-like 2-celled fr. in the large calyx-lobes; native in trop. Amer.

Solandras need a temperature of at least 50° and plenty of sunlight, also abundant water from early autumn to late spring, when grown under glass. In summer, during the rest season, they should be kept dry. A somewhat sandy loam is best, as too rich soil produces rank growth and little bloom. Propagated by cuttings of firm young shoots taken with a heel, giving them slight bottom heat.

grandiflora (*Swartzia grandiflora*). To 30 ft. or more, climbing: lvs. to 5 in. long: fls. fragrant, white, cream-colored or somewhat yellowish, to 10 in. long, the slender part of tube included in an enlarged calyx which is 2–3 in. long. W. Indies.

guttata (*Swartzia guttata*). To 20 ft., somewhat climbing, with hairy or pubescent twigs: lvs. to 6 in. long, pubescent underneath: fls. fragrant, cream-color changing to yellowish, spotted or feathered with purple, 9 in. long, the slender part of tube much longer than calyx which is 3 in. long and pubescent. Mex.—See *S. nitida.*

Hartwegii: *S. nitida.*

magnifica: hort. name.

nitida (*S. Hartwegii. Swartzia nitida*). To 20 ft. or more, erect or clambering and climbing, quite glabrous: lvs. mostly glossy: fls. yellow, 10 in. long, with purplish stripes, the corolla-lobes more or less reflexing. Mex.—Apparently the usual species in cult., although often passing as *S. guttata.*

spectabilis: hort. name for a white-fld. form.

SOLANUM. NIGHTSHADE. *Solanaceæ.* Herbs, shrubs and even trees, some of them climbing and some strongly spiny, including many ornamental subjects for the garden or conservatory, also the potato, eggplant, and a few medicinal plants: lvs. alternate, simple or compound: fls. often showy in white, yellow, blue and purple, wheel-shaped or shallowly bell-shaped: fr. a berry which is often decorative: species numerous, in many parts of the world, the following grown for ornament except *S. Melongena, S. muricatum, S. tuberosum* and sometimes *S. nigrum.*

Most of the species may be propagated from seeds, sown where the plants are to stand in the case of the annuals, but indoors for the foliage types. The greenhouse shrubby forms are increased also by softwood cuttings; *S. Pseudo-Capsicum*, Jerusalem-cherry, by both seeds and cuttings. The tuberous species are usually raised from the tubers, or from divisions of them, containing at least one eye or bud. See also *Eggplant, Potato, Tomato*; also *Potomato.*

aculeatissimum. Per. undershrub to 2 ft., with spiny sts. and lvs.: lvs. broad-ovate, 5–7-lobed, 4 in. long: fls. white, 1 in. across, in few-fld. cymes: fr. orange, globose and corrugated, to 2 in. across. Tropics.

æthiopicum. Shrub to 2 ft., unarmed: lvs. oblong, 5 in. long, undulate, glabrous: fls. white, ½ in. across, in few-fld. cymes: fr. pale red, globose, often lobed, large. Trop. Afr. to Asia.

alatum: *S, robustum.*

atropurpureum. Shrubby, with dark red spiny sts.: lvs. 5–7-parted into lanceolate undulate or sinuately lobed segms., pale beneath: fls. pale yellow, ⅓ in. long, in racemes about 1 in. long: fr. white turning yellow, globose, ½ in. across. Brazil.

auriculatum. Velvety-tomentose shrub to 20 ft., unarmed: lvs. ovate-oblong, to 8 in. long, entire, having small orbicular lvs. in axils: fls. violet or bluish-white. ½ in. across, in corymbs: fr. globose, ¾ in. across. Trop. Afr., trop. Amer.

aviculare. Shrub to 10 ft., unarmed and glabrous: lvs. variable, lanceolate and entire or pinnately lobed, to 1 ft. or more long: fls. purplish, to 1 in. across, in cymes: fr. yellowish, ovoid, 1 in. long. New Zeal., Australia.

Capsicastrum. FALSE JERUSALEM-CHERRY. Shrub to 2 ft., unarmed: lvs. oval or oblong, to 3 in. long, pubescent beneath, undulate: fls. white, ½ in. or less across: fr. scarlet or orange-red, ovoid and pointed, ½ in. across. Brazil. Var. **Melvinii** is a compact form about 1 ft. high. Var. **variegatum** has variegated lvs.—This species has pubescent twigs.

citrullifolium. Ann. to 3 ft., with yellow prickles: lvs. 2-pinnatifid, to 6 in. long: fls. violet, to 1½ in. across, in racemes: fr. prickly, 1 in. across. Ia. to Tex. and Mex.

Clevelandii: an improved form, probably of *S. Pseudo-Capsicum.*

coccineum: *S. integrifolium.*

cornutum. Pubescent very prickly ann. to 4 ft.: lvs. 2-pinnatifid, to 5 in. long: fls. yellow, 1 in. across, in cymes: fr. prickly, small. Mex.

crispum. Shrub or small tree: lvs. ovate to ovate-lanceolate, entire, to 4 in. long: fls. pale violet, ¾ in. across, in corymbs: fr. globose, pale yellow, about ¼ in. across. Chile, Peru.

crotonifolium. Pubescent shrub with flexuose branches: lvs. oblong, entire, to 6 in. long, white-tomentose beneath: fls. tomentose outside, ½ in across, in racemes: fr. globose, about ¼ in. across. N. S. Amer.

Dulcamara. BITTER-SWEET. Shrubby climber to 8 ft.: lvs. ovate or ovate-oblong, to 4 in. long, entire or lobed at base: fls. violet spotted with green, ½ in. across, the lobes reflexed, in long-stalked cymes: fr. scarlet, ovoid, ½ in. long, showy but poisonous. Eu. to Asia; nat. in N. Amer.

elæagnifolium. Per. to 3½ ft., silvery: lvs. oblong, to 6 in. long, wavy-margined: fls. violet or white, 1 in. across, in cymes: fr. yellow or black, globose, ½ in. across. Mo. to Ariz.

Gayanum. St. woody, pubescent: lvs. oval-oblong, entire, ciliate: fls. blue, hairy outside: fr. about ¼ in. across. Chile.

giganteum. To 25 ft., somewhat shrubby, the st. with short stout prickles: lvs. oblong, to 8 in. long, white-tomentose beneath: fls. pale violet or blue, ¾ in. across, in many-fld. cymes: fr. red, globose, ⅓ in. across. India, Ceylon.—Called "African-holly" in S. Calif. where it is grown out-of-doors.

gracile. Pubescent ann. to 2 ft.: lvs. oblong-lanceolate, to 4 in. long, whitish beneath: fls. white, ⅓ in. across, in racemes about 1 in. long: fr. black, globose, ¼ in. across. Brazil.

guatemalense: *S. muricatum.*

Hendersonii. A form of *S. Pseudo-Capsicum* or a hybrid, having numerous white fls. and orange-red frs.

heterodoxum. Spiny pubescent ann. to 3 ft.: lvs. 2-pinnate: fls. blue, ½ in. across, in short racemes: fr. green turning black, globose, ¼ in. across. Mex.

integrifolium (*S. coccineum*). SCARLET or TOMATO EGGPLANT. Pubescent spiny ann. to 3 ft.: lvs. ovate or oblong-ovate, sinuate-lobed, to 8 in. long: fls. white, ¾ in. across, in few-fld. clusters: fr. scarlet or yellow, globular, to 2 in. across, furrowed, grown for ornament. Afr.

jasminoides. Shrubby climber to 10 ft., glabrous and unarmed: lvs. ovate-lanceolate, to 3 in. long, entire or lower ones pinnate: fls. star-shaped, white tinged blue, 1 in. across, in branching clusters. Brazil. Var. **grandiflorum** has large clusters of fls.

Lycopersicum: the same as *Lycopersicon esculentum.*

macranthum. Spiny pubescent shrub to 6 ft. or more: lvs. ovate to lanceolate, sinuately lobed, to 1 ft. or more long: fls. bluish-violet, to 2 in. across, in racemes to 5 in. long. Brazil.

marginatum. Spiny shrub to 4 ft.: lvs. oblong-ovate, sinuately lobed, to 8 in. long, densely white-tomentose beneath: fls. white lined with blue, 1 in. across, in cymes: fr. yellow, globose, 1½ in. across, spiny. N. Afr.

Melongena. Pubescent spiny herb or subshrub to 3 ft.: lvs. ovate, angled or lobed, to 9 in. long: fls. violet-purple. to 1½ in. across, usually solitary: fr. blackish-purple, 6 in. long. Afr., Asia. Var. depressum. DWARF EGGPLANT. Small and glabrous: lvs. to 6 in. long: fr. to 5 in. long. Var. esculentum. COMMON EGGPLANT. Grown as ann.: lvs. to 15 in. long: fls. nodding, to 2 in. across: fr. shining, to 1 ft. long. purple, white, yellowish or striped. Var. serpentinum. SNAKE EGGPLANT. Fr. to 1 ft. long and 1 in. thick, curled at end.

muricatum (*S. guatemalense*). PEPINO. Spiny herb or subshrub to 3 ft.: lvs. oblong-lanceolate, to 6 in. long, entire or undulate: fls. bright blue, to ¾ in. across, in long-stalked clusters: fr. yellow marked with purple, ovoid, to 6 in. long. edible. Peru.

nigrum. Prostrate or erect ann. to 2½ ft.: lvs. ovate or lanceolate-ovate, entire or angled, to 5 in. or more long, eaten as greens: fls. white, ¼ in. across, in drooping clusters: fr. black, ¼ in. or more across. Cosmopolitan.—Cult. forms are known as "Garden Huckleberry" (var. *guineense*), "Wonderberry" and "Sunberry."

Pseudo-Capsicum. JERUSALEM-CHERRY. Shrub to 4 ft., glabrous and unarmed: lvs. oblong, to 4 in. long, undulate, shining above: fls. white, ½ in. across, solitary or clustered: fr. scarlet or yellow, globular, ½ in. across, long persistent, for which it is grown in pots. Old World.

Pseudo-Melongena. Glabrous unarmed ann.: lvs. ovate, undulate, dark green: fls. nodding: fr. red and green, large and fleshy. Habitat unknown. Probably a form of *S. integrifolium*.

Rantonnetii. Shrub to 6 ft., unarmed and nearly glabrous: lvs. ovate or oval, to 4 in. long, undulate: fls. dark blue or violet with paler eye, 1 in. across, in clusters: fr. red, heart-shaped, 1 in. long, drooping. Paraguay, Argentina.

robustum (*S. alatum*). Spiny densely rusty-tomentose shrub to 5 ft., with winged sts.: lvs. broad-ovate, sinuately lobed, to 1 ft. long: fls. white, 1 in. across, in axillary racemes: fr. orange, globose, ½ in. Brazil.

rubrum: a listed name of uncertain botanical standing.

Seaforthianum. Shrubby climber to 10 ft., glabrous and unarmed: lvs. mostly pinnate, to 8 in. long, the lfts. unequal: fls. star-shaped, blue or purple, to 1 in. across, in cymes: fr. scarlet, globose, ⅓ in. across. Trop. Amer.

sisymbrifolium. Sticky-pubescent spiny ann. to 4 ft.: lvs. pinnate into sinuate or toothed lobes: fls. light blue or white, 1¼ in. across: fr. red, globose, about ½ in. across. Trop. Amer.; nat. in N. Amer.

sodomeum. Spiny pubescent shrub to 6 ft.: lvs. pinnate into undulate or entire lobes: fls. violet, about 1 in. across, in cymes: fr. shining yellow, globose, 1 in. across. Medit. region.

texanum: a spineless race of *S. integrifolium*.

Torreyi. Hairy per. to 3 ft.: lvs. ovate, to 6 in. long, 5–7-lobed: fls. violet, to 1½ in. across, in cymes: fr. yellow, globose, 1 in. across. Kans. to Tex.

triquetrum. Vine-like per. with sts. to 4 ft. long, glabrous and unarmed: lvs. ovate to lanceolate, to 2½ in. long, entire or slightly 3-lobed at base: fls. purplish, ½ in. across: fr. globose, ⅓ in. across. Tex., Mex.

tuberosum. POTATO. Sts. weak, to 3 ft. long, unarmed, with underground edible tubers: lvs. pinnate, to 10 in. long, the lfts. ovate with smaller ones between: fls. white or bluish, about 1 in. across, in clusters: fr. yellowish or green, globular, to ¾ in. across. Probably Andes.

verbascifolium. Tomentose shrub or tree to 30 ft., unarmed: lvs. ovate or oval, to 1 ft. long, entire or slightly undulate: fls. white, ½ in. across, in cymes: fr. yellow, globose, to ¾ in. across. Tropics.

Wallacei. Sticky-hairy shrub to 3 ft.: lvs. cordate-ovate, undulate: fls. violet, to 1¾ in. across, in cymes: fr. dark purple. Calif. and isls.

Warscewiczii. Rusty-tomentose shrub to 6 ft., with short stout spines: lvs. to 1 ft. or more long, lobed to half width of blade: fls. white, 1½ in. across, in racemes: fr. pale yellow, shining, ½ in. across. S. Amer.

Wendlandii. Shrubby climber, prickly and glabrous: lvs. pinnate, with a large terminal lft., or upper lvs. simple: fls. lilac-blue, to 2½ in. across, in branched clusters: fr. globose. Costa Rica.

Xanti. Pubescent shrub with erect or decumbent sts. to 2 ft. long: lvs. ovate, to 1¾ in. long, entire or lobed: fls. violet, to 1 in. across, in cymes: fr. green or purplish, globose. Calif.

SOLDANELLA. *Primulaceæ*. Per. herbs native in the mts. of Eu., sometimes grown in rock-gardens, with basal lvs., nodding blue or violet or rarely white fls., solitary or in umbels, the corolla with fringed lobes. Grown in shady situations in moist soil. Propagated by division or seeds.

alpina. To 6 in.: lvs. roundish, to 1½ in. across: fls. pale blue, ½ in. long, in 1–3-fld. umbels, in spring.

montana. To 15 in.: lvs. roundish, to 2½ in. across: fls. blue, to ¾ in. across, in 3–10-fld. umbels, May–July.

pusilla. To 6 in.: lvs. roundish, to ½ in. across: fls. blue or violet, ½ in. long, usually solitary, in May.

SOLIDAGO. GOLDENROD. *Compositæ*. Many erect herbaceous perennials useful for borders and colonizing: lvs. simple and alternate: heads small, yellow or occasionally white, in thyrses, spikes, racemes or compound panicles, of ray- and disk-fls., blooming in late summer and autumn; pappus of bristles: native mostly in N. Amer. and characteristic of its autumnal flora.

The goldenrods improve in the garden but some of them become weedy if the soil is too rich. They are easily grown from seed, blooming the second year; the mature plants may be divided in spring or in autumn.

alpestris: *S. Virgaurea*.

altissima. To 8 ft., pubescent: lvs. lanceolate, to 6 in. long, mostly toothed: heads in recurved one-sided racemes forming dense broadly pyramidal panicles. Me. to Ga. and Tex.

arctica: a listed name.

arguta. To 4 ft.: lvs. ovate, to 16 in. long, coarsely toothed: heads in one-sided racemes in terminal panicles. Me. to Va. and Tenn.

bicolor. SILVERROD. To 4 ft.: lvs. oblong, to 4 in. long. toothed, pubescent: heads crowded in a narrow spike to 7 in. long, rays white. P. E. I. to Ga. and Tenn.

Boottii. To 5 ft.: lvs. ovate or oblong-lanceolate, to 6 in. long, toothed or entire: heads in one-sided spreading racemes in the loose panicle. Va. to Fla. and Tex.

brachystachys: hort. name.

Buckleyi. To 2 ft.: lvs. oblong, to 3½ in. long, toothed, pubescent beneath: heads in small axillary clusters. Ala.

cæsia. WREATH G. To 3 ft., glabrous, often glaucous: lvs. lanceolate, to 5 in. long, toothed: heads in axillary clusters or racemes. N. S. to Fla. and Tex.

canadensis (*S. reflexa*). To 5 ft.: lvs. linear-lanceolate, to 5 in. long, entire or toothed: heads in one-sided racemes forming large panicles. Newf. to Va. and Tenn.

corymbosa: probably only a southern form of *S. rigida*.

Cutleri. To 1 ft.: lvs. obovate, to 4 in. long, toothed: heads in short racemes. Mts., Me. to N. N. Y.

elongata. To 3 ft.: lvs. narrow-lanceolate, to 4 in. long, toothed, nearly glabrous: heads in dense thyrse-like panicles. B. C. to Mont. and Calif.

erecta. To 3 ft., nearly glabrous: lower lvs. oval, to 6 in. long, toothed, upper lanceolate, entire: heads in a narrow terminal thyrse. N. Y. to Ga. and Ala.

fistulosa. To 7 ft.: lvs. ovate-oblong to lanceolate, to 4 in. long, entire, rough on edges and midrib beneath: heads in one-sided racemes in the panicle. N. J. to Fla. and La.

flexicaulis. To 3 ft., nearly glabrous, with zigzag angled sts.: lvs. ovate. to 7 in. long, sharp-toothed: heads in axillary clusters. N. S. to Ga. and Mo.

glabra: a name of uncertain application.

glomerata. To 4 ft.: lvs spatulate or oval, to 1 ft. long, toothed: heads in axillary clusters. N. C., Tenn.

graminifolia (*S. lanceolata. Euthamia graminifolia*). To 4 ft.: lvs. linear-lanceolate, to 5 in. long, entire: heads in flat-topped compound corymbs. N. B. to Fla. and Neb.

hispida. To 3 ft., hairy: lvs. oval or oblong, to 5 in. long, mostly toothed: heads in dense terminal racemes. Newf. to Ga. and Mo.

juncea. To 4 ft., glabrous: lvs. lanceolate or oval-lanceolate, to 1 ft. long, toothed: heads in one-sided racemes forming a spreading panicle. N. B. to N. C. and Mo.

lanceolata: *S. graminifolia.*

latifolia. To 3 ft.: lvs. ovate, to 7 in. long, sharp-toothed: heads in short axillary racemose clusters. N. S. to Ga. and Mo.

Leavenworthii. To 4 ft.: lvs. linear-spatulate to linear-lanceolate, to 5½ in. long, toothed, margins ciliate: heads in one-sided racemes in the panicle. S. C. to Fla.

Lillei: listed name.

missouriensis. To 1½ ft., glabrous: lvs. linear-oblanceolate, to 6 in. long, entire or lower toothed: heads in a round-topped panicle. B. C. to S. D.

neglecta. To 4 ft.: lvs. lanceolate, to 1 ft. long, toothed: heads in one-sided racemes forming thyrsoid panicles. Swamps, Me. to Md. and Ill.

nemoralis. To 2 ft., gray-pubescent: lvs. oblanceolate, to 6 in. long, wavy-toothed: heads in one-sided racemes in the panicles. N. S. to Fla. and Ariz.

occidentalis (*Euthamia occidentalis*). To 5 ft., glabrous: lvs. linear, to 4 in. long, entire: heads in corymbose clusters. B. C. to Rocky Mts.

odora. To 4 ft.: lvs. lanceolate, to 4 in. long, entire, anise-scented: heads in one-sided racemes in large panicles. N. S. to Fla. and Tex.

ohioensis. To 3 ft., glabrous: lvs. lanceolate or oblong-lanceolate, to 1 ft. long, toothed toward tip: heads in terminal compound corymbs. N. Y. to Wis.

patula. To 7 ft.: lvs. oval or oblong, to 16 in. long, toothed or entire, rough above: heads in one-sided racemes in loose panicles. Swamps, Me. to Ga. and Tex.

pubens. To 5 ft., pubescent: lvs. spatulate, to 6 in. long, toothed: heads in axillary raceme-like clusters. N. C., Tenn., Ga.

puberula. To 3 ft.: lvs. oblong-lanceolate, to 2 in. long, toothed or entire: heads in terminal thyrse. P. E. I. to Fla. and Miss.

reflexa: *S. canadensis.*

Riddellii. To 3 ft., nearly glabrous: lvs. lanceolate, to 1 ft. long, entire: heads in dense corymbs. Ont. to Mo.

rigida. To 5 ft., gray-pubescent: lvs. ovate or oblong, to 2 in. long, usually entire: heads in dense compound corymbs. Mass. to Ga. and Tex.

rigidiuscula. To 4 ft.: lvs. lanceolate or ovate-lanceolate, to 5 in. long, entire or toothed: heads in dense narrow thyrse. Ohio to Colo. and Tex.

rugosa. To 8 ft.: lvs. oval to oblong-lanceolate, to 4 in. long, toothed: heads in one-sided racemes in compound panicles. Newf. to Fla. and Tex.

sempervirens. To 8 ft., nearly glabrous: lvs. oblong or lanceolate, to 1 ft. long, entire, fleshy: heads in one-sided racemes in large panicles. N. S. to Fla. and Mex., along coast.

serotina. To 8 ft., nearly glabrous: lvs. lanceolate or oblong-lanceolate, to 6 in. long, toothed: heads in large panicles. N. Amer.

Shortii. To 4 ft., nearly glabrous: lvs. oblong-lanceolate, to 4 in. long, toothed: heads in one-sided racemes in large panicles. Falls of Ohio River.

speciosa. To 7 ft., nearly glabrous: lvs. ovate to oblong, to 10 in. long, toothed: heads in large terminal thyrse. Mass. to N. C. and Ark.

spectabilis. To 2½ ft.: lvs. oblong to linear, toothed: heads in dense compound thyrse. Nev., Calif.

squarrosa. To 5 ft., nearly glabrous: lvs. spatulate or oblong, to 10 in. long, toothed: heads in terminal narrow thyrse to 1 ft. long. N. B. to N. C. and Ohio.

stricta. To 8 ft.: lvs. oblong to linear, to 8 in. long, entire, glabrous: fls. in dense thyrse-like panicles. N. J. to Fla. and La., Cuba.

tenuifolia (*Euthamia tenuifolia*). To 1½ ft., glabrous: lvs. narrow-linear, to 3 in. long, entire: heads in dense flat corymbs. Mass. to Fla. and La.

uliginosa. To 4 ft., glabrous: lvs. oblong-lanceolate or lanceolate, to 9 in. long, toothed: heads in dense terminal thyrse. Swamps, Newf. to N. C. and Wis.

Virgaurea (*S. alpestris*). European G. To 3 ft.: lvs. obovate, to 7 in. long, toothed: heads in dense terminal thyrse to 10 in. long. Eu.

SOLISIA. *Cactaceæ.* A segregate from Pelecyphora, being solitary rather than cespitose, juice milky, fls. small and lateral, tubercle axils naked. See *Cacti.*

pectinata (*Pelecyphora pectinata*). Globose, to 1 in. or slightly more diam., hidden by the overlapping clusters of 20–40 radial pectinate white spines: fls. yellow. Mex.—There is a cristate form.

SOLITARY: borne singly or alone.

SOLLYA. *Pittosporaceæ.* A few Australian evergreen climbing shrubs, with alternate simple lvs., small blue attractive nodding fls. in terminal cymes, and capsular frs.

One species is grown out-of-doors in the South where it makes a good cover for banks or fences, and in the greenhouse in the North. Propagated by seeds and cuttings under glass.

heterophylla. Australian Bluebell Creeper. To 6 ft. or more, twining: lvs. variable, from narrow lanceolate to oblong, to 2 in. long, much paler beneath: fls. to ½ in. long.

SOLOMONS-SEAL: *Polygonatum.* **False:** *Smilacina.*

SONCHUS. *Compositæ.* Old World ann. and per. succulent herbs, some of them weedy, with alternate lvs. and heads of yellow ligulate fls. in corymbs or panicles; pappus of soft white bristles. One species is sometimes grown for ornament in S. Calif.

congestus (*S. Jacquinii*). Per. to 2 ft.: lvs. oblanceolate, to 1 ft. long, pinnatifid to about middle: heads to 3 in. across, in panicles. Canary Isls.

Jacquinii: *S. congestus.*

major: hort. name.

SONERILA. *Melastomaceæ.* Herbs or subshrubs with simple 3–5-nerved lvs. that are often ornamental, showy fls. in racemes or spikes, and capsular frs.

One species is grown under glass in a temperature of about 75° and a humid atmosphere. Propagated by well-ripened cuttings under a bell glass, by division and also by seeds.

margaritacea. Lvs. ovate-lanceolate, purplish below, having rows of pearly spots between the nerves: fls. rose. Java.

SOPHORA. *Leguminosæ.* Mostly woody plants with pinnate lvs., papilionaceous fls. in terminal panicles or racemes, and usually cylindrical or 4-winged pods.

Sophoras are planted for ornament, the evergreen species hardy only in the southern states. Propagated by seeds, greenwood cuttings, layers or grafting.

Davidii: *S. viciifolia.*

japonica. Japanese Pagoda-Tree. Chinese Scholar-Tree. Deciduous tree to 80 ft.: lfts. to 2 in. long: fls. yellowish-white, ½ in. long, in panicles to 15 in. long: pods to 3 in. long. China, Korea. Var. pendula has pendulous branches.—Hardy N.

microphylla (*S. tetraptera* var. *microphylla*). Differs from *S. tetraptera* in the lfts. only ⅓ in. long and fls. to 1½ in. long. New Zeal.

platycarpa: *Cladrastis platycarpa.*

secundiflora (*Broussonetia secundiflora*). Mescal Bean. Evergreen shrub or tree to 40 ft.: lfts. to 2½ in.

long, shining: fls. violet-blue, 1 in. long, fragrant, in terminal racemes to 4 in. long: pods to 8 in. long. Tex. to N. Mex.

tetraptera (var. *grandiflora*). Evergreen tree to 40 ft.: lfts. to 1 in. long: fls. golden-yellow, 2 in. long, in 4–8-fld. racemes: pods to 8 in. long, 4-winged. New Zeal.

viciifolia (*S. Davidii*). Deciduous shrub to 8 ft.: lfts. to ½ in. long: fls. bluish-violet to nearly white, to ¾ in. long, in 6–12-fld. racemes: pods to 2 in. long. China.—Hardy N.

SOPHROCATLÆLIA. *Orchidaceæ.* A group comprising hybrids between the genera Sophronitis, Cattleya, and Lælia.

Danæ (*Sophrolælia laeta* × *C. Harrisoniana*).

SOPHRONITIS. *Orchidaceæ.* Small Brazilian epiphytes with 1-lvd. pseudobulbs and showy fls. solitary or in short terminal racemes, the sepals and petals similar, the lip entire and surrounding the column at base. For cult. see *Orchids*; grown mostly in shallow pans under the roof.

cernua. Lvs. about 1 in. long: fls. cinnabar-red, 1 in. across, in 2–4-fld. racemes, Nov.–Jan. Brazil.

coccinea (*S. grandiflora*). Lvs. leathery, to 3 in. long: fls. solitary, scarlet, the lip yellowish at base marked with scarlet, to 3 in. across, Nov.–Feb. Brazil.

grandiflora: *S. coccinea.*

SORBARIA (*Schizonotus*). FALSE-SPIREA. *Rosaceæ.* Asian deciduous shrubs with alternate pinnate and toothed lvs., and small white fls. in large terminal panicles.

Sorbarias are cultivated for ornament; they spread rather rapidly by suckers. They thrive in moist rich soil. Propagated by seeds, by suckers, by cuttings of ripe wood or root-cuttings.

Aitchisonii (*Spiræa Aitchisonii*). To 10 ft.: lfts. 15–21, less than ½ in. wide, glabrous: panicles to 10 in. long, upright, July–Aug. W. Asia.

arborea. To 18 ft.: lfts. 13–17, more than ½ in. wide, pubescent beneath: panicles to 1 ft. long, loose and spreading, July–Aug. China; hardy N. Var. **glabrata** has glabrous lfts.

assurgens. To 10 ft.: lfts. 13–17, more than ½ in. wide, pubescent on veins beneath: panicles to 6 in. long, upright, July. China; hardy N.

Lindleyana (*Spiræa Lindleyana*). To 18 ft.: lfts. 15–21, more than ½ in. wide, pubescent on veins when young: panicles to 1 ft. long, loose and spreading, July–Aug. Himalayas; stands far S.

sorbifolia (*Spiræa sorbifolia*). To 6 ft., hardy: lfts. 13–23, more than ½ in. wide, nearly glabrous beneath: panicles to 10 in. long, dense and upright, June–July. Asia; sometimes spontaneous; hardy far N. Var. **stellipila** (*S. stellipila*), lvs. stellate-pubescent beneath.

stellipila: *S. sorbifolia* var.

SORBARONIA. *Rosaceæ.* A genus established to contain hybrids between Sorbus and Aronia, with simple or partly pinnate lvs. Hardy N.

fallax (*Sorbus heterophylla*). Hybrid between *S. Aucuparia* and *A. melanocarpa:* similar to *S. hybrida* but nearly glabrous and with blackish fr.

hybrida. Hybrid between *S. Aucuparia* and *A. arbutifolia:* lvs. to 3 in. long, with lobes or lfts. toward base, pubescent beneath: fls. white or pinkish: fr. dark purple.

SORBOPYRUS. *Rosaceæ.* Hybrids of Sorbus and Pyrus. **S. auricularis** is a tree to 40 ft., with branchlets, under side of lvs., long pedicels and calyx tomentose or thickly pubescent: lvs. broad-elliptic, abruptly short-pointed, mostly rather broad at base, strongly serrate: fls. about ½ in. across, white, many in a corymb: fr. about ½ in. diam., pyriform, green or yellowish. A very old European plant considered to be a hybrid between *Pyrus communis* and *Sorbus Aria*, known under a variety of names as *Pyrus auricularis, P. Pollveria, P. Bollwylleriana, Sorbus Bollwylleriana, Bollwilleria auricularis.* It is sometimes planted for ornament and interest; hardy N.

SORBUS. MOUNTAIN-ASH. *Rosaceæ.* Deciduous trees or shrubs native in the north temp. zone, and hardy N., with alternate simple or pinnate lvs., white fls. in terminal compound corymbs in late spring, and fr. a berry-like usually bright red pome.

Most of the species are hardy in the North and will thrive even in dry soil. Propagated by seeds sown when ripe or stratified, by layers, or rare kinds by budding or grafting on *S. americana* or *S. Aucuparia.*

americana (*Pyrus americana*). AMERICAN M. To 30 ft.: lvs. of 11–17 lfts. to 4 in. long: fls. about ⅕ in. across, the infl. glabrous. Newf. to N. C. and Mich.

amurensis. Similar to *S. Aucuparia* but with acuminate more deeply toothed lfts. and orange-red frs. N. E. Asia.

Aria (*Pyrus Aria*). WHITE BEAM-TREE. To 50 ft.: lvs. elliptic, to 5 in. long, doubly toothed, white-tomentose beneath: fls. ½ in. across, the infl. tomentose. Eu. Vars. with yellow lvs. are **aurea, chrysophylla** and **lutescens.** Var. **Decaisneana** (var. *majestica*) has larger lvs.

Aucuparia (*Pyrus Aucuparia*). EUROPEAN M. ROWAN. To 50 ft.: lvs. of 9–15 lfts. to 2 in. long: fls. ⅓ in. across, the infl. pubescent. Eu. Commonly planted. Some of the hort. vars. are: **edulis,** fr. used for preserves; **fastigiata,** of narrow-pyramidal habit; **luteo-variegata,** lvs. variegated with yellow; **pendula,** branches long and drooping; **xanthocarpa** (var. *Fifeana*) fr. orange-yellow.

Bollwylleriana: *Sorbopyrus auricularis.*

Chamæmespilus. To 10 ft.: lvs. elliptic or oblong, to 3 in. long, toothed: fls. pink, the infl. tomentose. Eu.

commixta. To 25 ft.: lvs. of 11–15 lfts. to 3 in. long: fls. ⅓ in. across, the infl. glabrous. Japan, Korea.

decora. To 30 ft.: lvs. of 11–17 lfts. to 3 in. long: fls. ⅓ in. across, the infl. pubescent. Lab. to N. Y. and Minn.

discolor (*S. pekinensis*). To 30 ft.: lvs. of 11–15 lfts. to 3 in. long, glaucous beneath: fls. ⅓ in. across, the infl. nearly glabrous: fr. white or yellowish. N. China.

domestica (*Pyrus domestica. P. Sorbus*). SERVICE-TREE. To 60 ft.: lvs. of 11–21 lfts. to 3 in. long, tomentose beneath: fls. ½ in. across, the infl. tomentose. S. Eu., N. Afr., W. Asia. Var. **pomifera** has apple-shaped fr. and **pyrifera** pear-shaped.

heterophylla: *Sorbaronia fallax.*

Hostii. Hybrid between *S. Chamæmespilus* and *S. Mougeotii:* to 12 ft.: lvs. simple, tomentose beneath: fls. pinkish.

hybrida (*S. quercifolia. Pyrus pinnatifida*). Hybrid between *S. Aucuparia* and *S. intermedia:* to 40 ft.: lvs. lobed or sometimes divided, tomentose beneath: fls. ½ in. across, the infl. pubescent. Var. **neuillyensis** has distinct lfts.

intermedia. To 30 ft.: lvs. to 4 in. long, pinnately lobed to one-third or less the width, gray-tomentose beneath: fls. ½ in. across, the infl. tomentose. N. Eu.

lanuginosa: *S. thuringiaca.*

latifolia. Hybrid between *S. Aria* and *S. torminalis:* to 50 ft.: lvs. ovate, to 4 in. long, with shallow lobes, tomentose beneath: fls. ½ in. across, the infl. tomentose.

majestica: *S. Aria* var. *Decaisneana.*

Mougeotii. To 60 ft.: lvs. ovate or ovate-oblong, lobed, white-tomentose beneath. Mts. of Cent. Eu.

pekinensis: *S. discolor.*

pohuashanensis. Small tree: lvs. of 11–15 lfts. to 2½ in. long, pubescent beneath, with large persistent stipules: infl. tomentose. China.

quercifolia: *S. hybrida.*

sambucifolia. To 8 ft.: lvs. of 9–11 lfts. to 3 in. long, shining above: fls. ½ in. across, the infl. pubescent. N. Asia, Japan.

thuringiaca (*S. lanuginosa*). Hybrid between *S. Aucuparia* and *S. Aria*: lvs. with 1–3 pairs of lfts.

torminalis (*Pyrus torminalis*). WILD SERVICE-TREE. To 50 ft.: lvs. ovate, to 5 in. long, with pointed lobes: fls. ½ in. across, the infl. tomentose. Eu., N. Afr., Asia Minor.

SORGHUM: *Holcus.*

SORREL: *Rumex.* **Jamaica**: *Hibiscus Sabdariffa.* **-Tree**: *Oxydendrum arboreum.* **Wood-**: *Oxalis.*

SORROWLESS TREE OF INDIA: *Saraca indica.*

SORUS: a heap or cluster; the fruit-dots or -clusters of ferns (plural sori).

SOTOL: *Dasylirion.*

SOUR BERRY: *Rhus integrifolia.* **-Wood**: *Oxydendrum arboreum.*

SOURSOP: *Annona muricata.*

SOUTHERNWOOD: *Artemisia Abrotanum.*

SOYBEAN: *Glycine Max.*

SPADIX: a thick or fleshy spike of certain plants, as the Araceæ, surrounded or subtended by a spathe.

SPANISH BAYONET: *Yucca aloifolia.* **Dagger**: *Yucca gloriosa.*

SPARAXIS. WAND-FLOWER. *Iridaceæ.* Spring-blooming S. African herbs having corms, narrow mostly basal lvs. and fls. in short spikes, the perianth-tube short. Cult. and treatment as for *Ixia.*

grandiflora. To 1 ft.: fls. yellow or purple, 1 in. or more long.

pulcherrima: *Dierama pulcherrima.*

tricolor. To 1½ ft.: fls. dark purple or yellow tinged with brown-purple or white with purple, having a yellow throat and dark blotch at base of each segm., 1 in. or more long.

SPARKLEBERRY: *Vaccinium arboreum.*

SPARMANNIA. *Tiliaceæ.* African white-hairy trees and shrubs with alternate toothed or lobed large lvs., white fls. in terminal umbels, and spiny capsular fr. See *Rehmannia* for another use of the name Sparmannia.

A few species are planted out-of-doors in the South and in the greenhouse, where they should be given a moderate temperature and plenty of air and light. Propagated by cuttings of the young shoots.

africana. To 20 ft., often with many trunks: lvs. 5–7-angled, to 9 in. long, heart-shaped at base: fls. to 1½ in. across, white with yellow stamens: fr. ½ in. across. S. Afr. Var. **flore-pleno** has double fls.

palmata (*Entelea palmata*). Shrub: lvs. deeply 5–7-lobed: fls. purplish, in dense umbels. S. Afr.

SPARTIUM. *Leguminosæ.* One ornamental shrub native in S. Eu., and grown out-of-doors as far north as Cent. U. S., and on the Pacific coast. Propagated by seeds and greenwood cuttings under glass.

junceum (*Genista juncea*). SPANISH BROOM. WEAVERS BROOM. To 10 ft., with almost leafless rush-like branches: lvs. simple, to 1 in. long: fls. yellow, papilionaceous, fragrant, 1 in. long, in terminal racemes to 18 in. long: pods flattened, hairy, to 4 in. long. Var. **nanum**, a dwarf form, is listed.

multiflorum: *Cytisus multiflorus.*

scoparium: *Cytisus scoparius.*

SPARTOCYTISUS NUBIGENUS: *Cytisus fragrans.*

SPATHE: the bract or leaf surrounding or subtending a flower-cluster or a spadix; it is sometimes colored and flower-like, as in the calla (Zantedeschia).

SPATHIPHYLLUM. *Araceæ.* Trop. American nearly stemless herbs, having oblong lvs. with strong midribs and sheathing petioles, and bisexual fls. on erect densely-fld. spadices which are shorter than the spathes; grown as foliage plants in a warm greenhouse.

candidum: *S. Patini.*

cochlearispathum (*S. heliconiifolium*). Lvs. to 2½ ft. long and 10 in. wide, thin, the margin often slightly wavy, the petioles to 2½ ft. long: spathes to 10 in. long, the spadix whitish. Mex., Cent. Amer.

floribundum. Lvs. to 6 in. long and 2½ in. wide, unequal sided, dark green above and paler beneath, the petioles to 6 in. long: spathes to 2½ in. long, white, the spadix greenish-yellow or white. Colombia.

heliconiifolium: *S. cochlearispathum.*

Patini (*S. candidum*). Lvs. to 10 in. long and 2½ in. wide, the petioles to 1 ft. long: spathes about 3 in. long, whitish. Colombia.

SPATHODEA. *Bignoniaceæ.* Trop. African evergreen trees with pinnate lvs., bell-shaped orange-red or scarlet fls. in terminal racemes or panicles, the calyx split and sheath-like, and woody capsular frs.

One is grown as a street tree in the tropics and sometimes in southern United States. It requires fertile well-drained soil for best results but grows under many conditions. Propagated by seeds or cuttings.

campanulata. To 70 ft.: lvs. of 9–19 ovate-lanceolate entire nearly glabrous lfts. to 4 in. long: fls. scarlet, 4 in. long, with leathery calyx 2½ in. long: fr. 8 in. long and 2 in. across.—Showy tree.

SPATHOGLOTTIS. *Orchidaceæ.* Terrestrial orchids with pseudobulbs bearing 2–5 plaited lvs. and large fls. in terminal racemes, the petals usually broader than sepals, the lip 3-lobed; grown in a warm greenhouse. See *Orchids.*

Vieillardi. Lvs. to 2 ft. long: fls. violet or nearly white with orange-brown lateral lobes of lip, 2 in. across, in short racemes on stalks to 2 ft. high, Sept. New Caledonia.

SPATHYEMA: *Symplocarpus.*

SPATTERDOCK: *Nymphozanthus.*

SPATULATE, SPATHULATE: oblong with the basal end attenuated; somewhat spoon- or ladle-shaped.

SPEARMINT: *Mentha spicata.*

SPECIES (the word is either singular or plural). A kind of plant or animal that is distinct from other kinds in marked or essential features, that has good characters of identification, and may be assumed to represent in nature a continuing succession of individuals from generation to generation. The term is incapable of exact definition; it is only by long practice in systematic botany or zoology that a person arrives at a defensible conception of species-lines, and these persons become the authorities. Certain species, as sassafras, orchard-grass, belladonna lily, are well-marked and clearly definable whereas others may be so variable that the species is difficult to diagnose with clearness. Plants that to one person constitute a single species may to another person represent two or more species; there is no absolute criterion.

The species is the primary or fundamental conception in the understanding of the forms of life. It is the unit in classification. Species are combined into genera (see *Genus*), and variations or subordinate forms of them are varieties (see *Variety*). Botanical binomial nomenclature begins with Species Plantarum (Species of Plants) of Linnæus published in 1753. The name of a species is two words, one representing the genus or group and the other identifying the particular kind or member of the group. Thus there are some 300 species of violets, all of the genus *Viola*; the florists violet is named *Viola odorata*, the horned violet *V. cornuta*, the birds-foot violet *V. pedata*; in this case *odorata*, *cornuta*, *pedata* are *specific* or *species-names*. Authors differ on the limits or definition of genera, and thus it happens that a species may be plàced in different genera by different writers, but the original specific name normally follows it in whatever genus it may rest; thus the peach was *Amygdalus Persica* to Linnæus and this disposition of it is followed by some of the contemporary authors; other authors prefer to place it in the genus with the other orchard stone-fruits, and it is then *Prunus Persica*. Some authors keep the genus Azalea separate, others unite it with Rhododendron; the pinxter-flower may therefore bear the name *A. nudiflora* or *R. nudiflorum*.

The number of species of plants is unknown. Of course the count depends to some extent on the varying definitions by different authors. The earth is yet only partially explored for the species of plants and animals. Among the seed-plants or spermatophytes ("flowering plants") upwards of three-fourths of a million specific names have been published; many of these names are duplicates or synonyms, but it is probably fair to assume that more than half of them represent separate species in nature. The species of plants have originated under natural conditions, yet some of them have been recognized only after having been introduced to cultivation; it is not yet agreed whether any plants distinct and permanent enough to be called species have been produced as the direct result of the processes of cultivation: knowledge of this subject is yet scant and imperfect. See *Cultigen*, *Indigen*.

SPECULARIA. *Campanulaceæ.* Ann. herbs differing from Campanula chiefly in the wheel-shaped corolla, long calyx-tube, and other technical floral characters; grown in the flower-garden, rock-garden and for edgings. Propagated readily by seeds.

pentagonia (*Campanula pentagonia*). To 1 ft., hairy: lvs. obovate to linear-lanceolate, nearly entire: fls. blue, solitary, the calyx-lobes spreading. Asia Minor.

Speculum-Veneris (*S.* and *Campanula Speculum*). Venus Looking-Glass. To 15 in., nearly glabrous: lvs. oblong, to 1½ in. long, toothed: fls. violet-blue or white, sometimes double, ¾ in. across, 1–3 together, the calyx-lobes reflexed. Eu., N. Afr., W. Asia.

SPEEDWELL: *Veronica.*

SPELT: *Triticum æstivum* var. *Spelta.*

SPERGULA. *Caryophyllaceæ.* Ann. herbs in temp. regions of the world: lvs. awl-shaped, usually clustered in the axils: fls. white, in terminal cymes. Spurry is sometimes grown for forage and as a green-manure crop on poor sandy soils.

arvensis. Differs from *S. sativa* in being bright green, not sticky, and seeds with whitish papillæ.

pilifera: *Sagina subulata.*

sativa. Spurry. Dull green, sticky, to 1½ ft.: lvs. linear, in clusters of 6–8 at the nodes: fls. small, numerous; seeds not papillate. Eu.; sometimes escaped in E. U. S.

SPHACELE. *Labiatæ.* Shrubs or sub-shrubs native in Calif., Hawaii and S. Amer., one offered in Calif.: fls. solitary in axils of bracts, forming leafy racemes; corolla with 4 small lobes and one larger lobe.

calycina. To 5 ft., pubescent: lvs. ovate or oblong-ovate, to 4 in. long, toothed: fls. white or pinkish, about 1 in. long; calyx inflated in fr. Calif.

SPHÆRALCEA (*Phymosia*). Globe-Mallow. *Malvaceæ.* Shrubs or herbs mostly of warm regions in Amer. and Afr., with alternate usually angled or lobed lvs., lilac to purple and red fls. solitary or clustered, and many carpels in a ring around an axis; grown in the garden, and sometimes under glass. Propagated by seeds or greenwood cuttings.

angustifolia. Per. to 6 ft.: lvs. lanceolate, toothed: fls. pink or red, 1 in. across, in clusters. Mex.

cisplatina (*Malva miniata*). Subshrub to 4 ft.: lvs. 3-lobed, the middle lobe the longest: fls. brick-red, to 1¼ in. across, in axillary clusters. La Plata.

cuspidata. Per. to 3 ft., pubescent: lvs. lanceolate or linear-lanceolate, slightly toothed: fls. pink or red, ½ in. across, in clusters. Colo. to Mex.

fasciculata: *Malvastrum fasciculatum.*

Munroana. Per. to 2 ft.: lvs. obscurely 3-lobed: fls. scarlet or rose, 1 in. across, in clusters. W. N. Amer.

rosea (*S. vitifolia*). Similar to *S. umbellata* but with bractlets united below the middle rather than distinct, and longer fls. Guatemala.

subrhomboidea. Per. to 1½ ft.: lvs. rhombic, 3-parted halfway down, grayish-green: fls. scarlet, ⅓ in. long, in dense panicles. Utah.

umbellata. Shrub or tree to 15 ft.: lvs. rotund, shallowly 7-lobed: fls. scarlet, white at base, 2 in. across, in clusters. Mex.

vitifolia: *S. rosea.*

SPHÆROGYNE LATIFOLIA: *Tococa platyphylla.*

SPHÆROSTIGMA: *Œnothera.*

SPHENOGYNE: *Ursinia.*

SPICE-BUSH: *Benzoin æstivale.*

SPIDER-FLOWER: *Cleome spinosa.*

SPIDERWORT: *Tradescantia.* **Family:** *Commelinaceæ.*

SPIGELIA. *Loganiaceæ.* American herbs with opposite entire lvs., tubular red, yellow or purplish fls. in one-sided cymes, and capsular frs.; one species is sometimes transplanted to the border.

marilandica. Pink-Root. Per. to 2 ft.: lvs. ovate, to 4 in. long, sessile: fls. red outside, yellow inside, to 2 in. long, May–July. N. C. to Fla. and Tex.

SPIKE: compact more or less simple indeterminate mostly elongated cluster with flowers sessile or nearly so.

SPIKENARD, AMERICAN: *Aralia racemosa.*

SPILANTHES. *Compositæ.* Mostly creeping or spreading herbs with opposite toothed lvs. and terminal long-stalked heads of yellow or white ray-fls. and yellow disk-fls.; pappus of awns. One species is grown for the lvs. which give a pungent flavor to salads.

oleracea. Diffuse: lvs. broadly ovate, wavy-toothed: heads ovoid, without ray-fls., greenish-yellow, to 1 in. long, the involucre-bracts oblong, Aug.–Oct. Tropics.—This plant has apparently been grown as *S. alba* but that species has white fls. and the involucre-bracts are narrow.

SPINACH: *Spinacia.* New Zealand: *Tetragonia expansa.* -Rhubarb: *Rumex abyssinicus.*

SPINACIA. Spinach. *Chenopodiaceæ.* Asian annuals with alternate lvs. and small unisexual fls., the pistillate axillary and the staminate in terminal spikes or panicles; one species commonly grown for greens. **S. oleracea.** Prickly-seeded S. To 2 ft.: lower lvs. broadly ovate to orbicular, lobed at base and sometimes on sides, st.-lvs. narrower: fr. or "seed" inclosed in a spiny caps.-like body. S. W. Asia. Var. **inermis** (var. *glabra*), Round-seeded S., has spineless seeds.

Spinach should be grown only in spring and autumn and does best in rich soil. Seed may be sown in drills 12–14 inches apart in early spring. It also may be forced by planting in hotbeds in February or March. Seed may be sown in autumn early enough for the plants to have a good start before frost and covered over winter with straw or dry manure, in mild climates. This winter protection may be removed early in the spring.

SPINDLE-TREE: *Euonymus.*

SPINE: a strong and sharp-pointed woody body mostly arising from the wood of the stem, representing a branch or a separate outgrowth.

SPINESCENT: more or less spiny.

SPINOVITIS: *Vitis Davidi.*

SPIRÆA. Spirea. *Rosaceæ.* Deciduous attractive shrubs with alternate simple lvs., white or pink fls. in umbel-like racemes, corymbs or panicles, and fr. a dehiscent follicle; native in the northern hemisphere and popular ornamental subjects for lawn and landscape planting.

Spireas thrive in any good land but require plenty of moisture and sunny exposure. Propagated by seeds sown as soon as ripe or stratified, by cuttings of green wood in summer under glass, by cuttings of mature wood and some species by layers. There are many horticultural forms and hybrids. The species are hardy to New York City and beyond unless otherwise stated.

The planter may find a wide range of adaptable white-flowered and pink-flowered shrubs among the spireas. If allowed to take their natural growth, without shearing, they soon make attractive masses with side branches arching or drooping to meet the ground in good flowing lines. A baker's dozen of them are *S. prunifolia, Thunbergii, Vanhouttei, trilobata, crenata, hypericifolia, chamædryfolia, japonica, salicifolia, cantoniensis, Billardii, tomentosa, Bumalda,* hardy and dependable over a wide range of country. Little pruning will be necessary, although *S. Thunbergii* and some others may be injured on the tips by winter and these parts may be cut back. The spring-flowering kinds, as *S. prunifolia, Vanhouttei, trilobata, crenata,* may be pruned after blooming, if at all; the summer-flowering kinds, as *S. Bumalda, Billiardii, japonica, salicifolia, tomentosa,* may be pruned in spring (if at all) to stimulate flower-bearing shoots of the season.

Aitchisonii: *Sorbaria Aitchisonii.*

alba. Meadowsweet. To 6 ft.: lvs. pubescent on veins beneath: fls. white, in elongated leafy pubescent panicles, June–Aug. N. Y. to Ga. and Miss.

albiflora (*S. japonica* var. *alba*). To 2 ft.: lvs. glabrous: fls. white, in dense compound pubescent corymbs, July–Aug. Japan.

amœna. To 6 ft.: lvs. pubescent on veins beneath: fls. white or pinkish, in corymbs to 4 in. across, July. Himalayas.—Needs protection N.

arguta. Hybrid between *S. Thunbergii* and *S. multiflora:* fls. white, in many-fld. umbels, borne profusely in May.

ariæfolia: *Holodiscus discolor* var. *ariæfolius.*

Aruncus: *Aruncus sylvester.*

assurgens: probably *Sorbaria assurgens.*

astilboides: *Astilbe astilboides.*

bella. To 3 ft., diœcious: lvs. nearly glabrous, glaucous beneath: fls. pink, in compound corymbs, June. Himalayas; not hardy N.

bethlehemensis: *S. latifolia.*

Billiardii (*S. californica. S. Lenneana*). Hybrid between *S. Douglasii* and *S. salicifolia:* to 6 ft.: lvs. gray-tomentose beneath when young: fls. bright pink, in dense pubescent panicles, July–Aug.

blanda. Hybrid between *S. chinensis* and *S. cantoniensis:* lvs. gray-tomentose beneath: fls. white, in pubescent umbels.

Blumei (*S. rupestris*). To 5 ft.: lvs. blue-green beneath, glabrous: fls. unisexual, white, in many-fld. umbels, June. Japan, Korea; not hardy N.—See *S. trilobata.*

brachybotrys (*S. pruinosa*). Hybrid between *S. canescens* and *S. Douglasii:* lvs. gray-tomentose beneath: fls. pink, in dense tomentose panicles.

bracteata: *S. nipponica.*

bullata (*S. crispifolia*). To 1½ ft.: lvs. nearly glabrous, thick and bullate: fls. rose, in corymbs, July–Aug. Japan.

Bumalda. Hybrid between *S. japonica* and *S. albiflora:* to 2 ft.: lvs. glabrous: fls. deep pink to white, in flat corymbs. Anthony Waterer, with bright carmine fls., is the common form. Var. **Frœbeli** (*S. Frœbeli*) is taller, with bright crimson fls.

cæspitosa: *Petrophytum cæspitosum.*

californica: *S. Billiardii.*

callosa: *S. japonica.*

camtschatica: *Filipendula camtschatica.*

cana. To 3 ft. or more: lvs. grayish-pubescent on both sides: fls. white, in dense pubescent umbels, May. S. Eu.

canescens (*S. flagelliformis. S. rotundifolia*). To 10 ft.: lvs. grayish-green, pubescent beneath: fls. white, in dense pubescent corymbs, July. Himalayas; may need protection N.

cantoniensis (*S. Reevesiana*). To 5 ft.: lvs. bluish-green and glabrous beneath: fls. white, in dense glabrous umbels, June. China, Japan. Var. **lanceata** has lanceolate lvs. and double fls.

capitata: *Physocarpus capitatus.*

carpinifolia: *S. latifolia.*

chamædryfolia (*S. flexuosa*). To 5 ft.: lvs. bright green, nearly glabrous: fls. white, in umbel-like glabrous corymbs, May–June. N. E. Asia. Var. **ulmifolia** (*S. ulmifolia*) has broader doubly toothed lvs.

chinensis. To 5 ft.: lvs. yellow-tomentose beneath: fls. white, in many-fld. densely pubescent umbels, May. China; not hardy N.

cinerea. Hybrid between *S. hypericifolia* and *S. cana:* lvs. pubescent, usually entire: fls. white, in umbels.

confusa: *S. media.*

conspicua. Hybrid between *S. albiflora* and probably *S. latifolia:* to 3 ft.: lvs. pubescent only on veins beneath: fls. pink, in clusters forming a broad-pyramidal panicle.

corymbosa. To 3 ft. or less: lvs. bluish-green beneath and nearly glabrous: fls. white, in slightly pubescent corymbs to 4 in. across, June–July. N. Y. to Ga. and Ky.

crenata. To 3 ft.: lvs. grayish-green, becoming glabrous, 3-nerved: fls. white, in dense pubescent umbels, May. S. E. Eu., Asia.

crispifolia: *S. bullata.*

dasyantha. Lvs. white-tomentose beneath: infl. grayish-tomentose. China.

decumbens. Procumbent, to 10 in.: lvs. glabrous: fls. white, in corymbs, June. S. Eu.

discolor: *Holodiscus discolor.*

Douglasii. To 8 ft.: lvs. white-tomentose beneath: fls. deep rose, in long narrow tomentose panicles, July–Aug. B. C. to Calif.

Filipendula: *Filipendula hexapetala.*

flagelliformis: *S. canescens.*

flexuosa: *S. chamædryfolia.*

Fontenaysii. Hybrid between *S. canescens* and *S. salicifolia:* to 6 ft.: lvs. pale and nearly glabrous beneath: fls. white, in pubescent panicles, June–July.

Fortunei: *S. japonica* var.

Foxii. Hybrid between *S. corymbosa* and *S. japonica:* lvs. glabrous: fls. white or pinkish, in pubescent corymbs.

Frœbeli: *S. Bumalda* var.

gemmata. To 10 ft.: lvs. gray-green beneath, entire: fls. white, in glabrous umbels, May. China.

gigantea: *Filipendula camtschatica.*

Henryi. To 8 ft.: lvs. pubescent beneath: fls. white, in loose pubescent corymbs, June. China. Var. **notabilis** has larger corymbs.

Hookeri: hort. name of uncertain application.

Humboldtii: *Aruncus sylvester.*

hypericifolia. To 6 ft.: lvs. grayish-green, nearly glabrous: fls. white, in sessile umbels, Apr.–May. S. E. Eu., Asia. Var. **obovata** (*S. obovata*) has obovate lvs.

japonica (*S. callosa*). To 6 ft.: lvs. pale beneath, pubescent only on veins: fls. pink, in compound pubescent corymbs, June–July. Japan. Var. **Fortunei** (*S. Fortunei*) is taller, with glabrous lvs. and pink fls. Var. **macrophylla**, lvs. to 6 in. long, bullate. Var. **ovalifolia**, fls. white.

lævigata: *Sibiræa lævigata.*

latifolia (*S. bethlehemensis. S. carpinifolia*). To 5 ft.: lvs. glabrous: fls. white or pinkish, in glabrous panicles, June–Aug. Newf. To N. C.

Lenneana: *S. Billiardii.*

Lindleyana: *Sorbaria Lindleyana.*

lobata: *Filipendula rubra.*

lucida. To 3 ft.: lvs. glabrous, shining above: fls. white, in flat glabrous corymbs to 4 in. across, June–July. B. C. to Ore. and S. D.

Margaritæ. Hybrid between *S. japonica* and *S. superba:* to 5 ft.: lvs. pale beneath and pubescent only on veins: fls. bright rose, in leafy pubescent corymbs, July.

media (*S. confusa*). To 5 ft.: lvs. slightly pubescent: fls. white, in many-fld. glabrous umbel-like racemes, May. Eu., Asia. Var. **mollis** has lvs. more pubescent.

Menziesii. To 5 ft.: lvs. pale beneath, pubescent only on veins: fls. rose, in dense narrow pubescent panicles, June–Aug. Alaska to Ore.

Miyabei. To 3 ft.: lvs. glabrous: fls. white, in pubescent compound corymbs, June. Japan.

multiflora. Hybrid between *S. crenata* and *S. hypericifolia:* fls. white, before the lvs.

Nicoudierti: *S. pikoviensis.*

nipponica (*S. bracteata*). To 8 ft.: lvs. blue-green beneath, glabrous: fls. white, in many-fld. umbel-like racemes, June. Japan. Var. **rotundifolia** has larger lvs. and fls.

Nobleana: *S. sanssouciana.*

notha. Hybrid between *S. corymbosa* and *S. latifolia:* lvs. nearly glabrous: fls. white or pinkish, in glabrous panicles.

nudiflora. Hybrid between *S. amœna* and *S. chamædryfolia* var. *ulmifolia:* lvs. nearly glabrous: fls. pinkish-white, in pubescent corymbs.

obovata: *S. hypericifolia* var.

opulifolia: *Physocarpus opulifolius.*

palmata: *Filipendula purpurea.*

pectinata: *Luetkea pectinata.*

pikoviensis (*S. Nicoudierti*). Hybrid between *S. crenata* and *S. media:* lvs. nearly glabrous: fls. white, in glabrous umbels.

pruinosa: *S. brachybotrys.*

prunifolia. BRIDAL WREATH. To 6 ft.: lvs. glabrous or pubescent beneath: fls. white, in few-fld. sessile umbels, Apr.–May. Korea, China. Var. **plena** has lvs. shining above and double fls.

pubescens. To 6 ft.: lvs. gray-tomentose beneath: fls. white, in many-fld. glabrous umbels, May. China.

pyramidata. Hybrid between *S. lucida* and *S. Menziesii:* to 3 ft.: lvs. glabrous: fls. white or pinkish, in dense pyramidal panicles.

Reevesiana: *S. cantoniensis.*

revirescens. Hybrid between *S. amœna* and *S. japonica:* to 3 ft.: lvs. yellow-tomentose on veins: fls. rose, in loose tomentose corymbs.

rosea: *S. splendens.*

Rosthornii. To 6 ft.: lvs. pubescent on veins beneath: fls. white, in loose pubescent corymbs, June. China.

rotundifolia: *S. canescens.*

rupestris: *S. Blumei.*

salicifolia. To 6 ft.: lvs. pale and glabrous beneath: fls. pink, in pyramidal pubescent panicles, June–July. S. Eu. to Japan.

sanssouciana (*S. Nobleana*). Hybrid between *S. Douglasii* and *S. japonica:* to 5 ft.: lvs. pale and pubescent beneath: fls. rose, in dense pyramidal pubescent panicles, July–Aug.

Sargentiana. To 6 ft.: lvs. pubescent beneath and slightly so above: fls. creamy-white, in pubescent corymbs 1½ in. across, June. China.

Schinabeckii. Hybrid between *S. chamædryfolia* and *S. trilobata:* lvs. glabrous: fls. white, in umbels.

semperflorens. Hybrid between *S. japonica* and *S. salicifolia:* lvs. nearly glabrous: fls. rose, in much branched pubescent panicles.

sorbifolia: *Sorbaria sorbifolia.*

splendens (*S. rosea*). To 4 ft.: lvs. glabrous: fls. rose, in slightly pubescent corymbs, June. Ore., Calif.; probably not hardy in N. E.

superba. Hybrid between *S. albiflora* and *S. corymbosa:* lvs. nearly glabrous: fls. pink, in terminal corymbs, June–July.

syringæflora. Hybrid between *S. albiflora* and *S. salicifolia:* lvs. nearly glabrous beneath: fls. pink, in pyramidal pubescent panicles.

Thunbergii. To 5 ft., twiggy: lvs. linear-lanceolate, glabrous: fls. white, in few-fld. sessile umbels, Apr.–May. Japan, China.

tomentosa. HARDHACK. STEEPLEBUSH. To 4 ft.: lvs. yellow-tomentose beneath: fls. rose or purple, in dense narrow tomentose panicles, July–Sept. N. S. to Ga. and Kans. Var. **alba** has white fls.

trichocarpa. KOREAN BRIDAL WREATH. To 6 ft.: lvs. glabrous: fls. white, in pubescent umbels, June. Korea.

trilobata. To 4 ft.: lvs. pale and glabrous beneath, slightly 3–5-lobed: fls. white, in many-fld. umbels, May–June. Asia.—Sometimes cult. under the name *S. Blumei.*

Ulmaria: *Filipendula Ulmaria.*

ulmifolia: *S. chamædryfolia* var.

Vanhouttei. Hybrid between *S. cantoniensis* and *S. trilobata:* to 6 ft.: lvs. bluish-green and glabrous beneath: fls. white, in many-fld. umbels, May–June.

Veitchii. To 12 ft.: lvs. pubescent beneath: fls. white, in dense pubescent corymbs, June–July. China.

venusta: *Filipendula rubra* var. *venusta.*

virginiana. To 4 ft.: lvs. pubescent only on veins beneath: fls. white, in pubescent corymbs, June. Va. to N. C. and Tenn.

Walluffi: a hort. name.

Wilsonii. To 8 ft.: lvs. pubescent on both sides: fls. white, in dense glabrous corymbs, June. China.

SPIRANTHES (*Ibidium*). LADIES-TRESSES. *Orchidaceæ.* Widely distributed terrestrial orchids with slender sts. bearing lvs. toward base and small fls. in twisted terminal spikes, the sepals free or united with petals, the lip usually entire and spurless; grown in shady locations out-of-doors. See *Orchids.*

brevifolia: *S. longilabris.*

cernua. To 2 ft.: lvs. linear-lanceolate, to 14 in. long: fls. creamy-white, nodding, about ¼ in. long, in spikes to 5 in. long, Aug.–Oct. Newf. to New Mex.

gracilis. To 2 ft.: lvs. to 2 in. long and ½ in. wide: fls. white, about ⅛ in. long, in one-sided or twisted spikes to 3 in. long, Aug.–Oct. N. S. to Fla. and Tex.

latifolia: *S. lucida.*

longilabris (*S. brevifolia*). To 16 in.: lvs. lanceolate, to 2 in. long: fls. white, about ⅛ in. long, blooming from fall to spring. Fla. to La.

lucida (*S. latifolia. S. plantaginea,* in part). To 10 in.: lvs. lanceolate, to 5 in. long: fls. white with pale yellow lip, ¼ in. long, in dense spikes to 2 in. long. N. S. to Va., west to Minn.

picta: *Sarcoglottis picta.*

plantaginea: *S. lucida.*

Romanzoffiana. To 16 in.: lvs. oblong-lanceolate, to 7 in. long: fls. greenish-white, ½ in. long, in dense spikes to 5 in. long. Alaska to Calif.

SPIREA: *Spiræa.* Blue: *Caryopteris incana.* **False-:** *Sorbaria.* **Rock-:** *Holodiscus discolor.*

SPIRODELA: see *Lemna.*

SPIRONEMA. *Commelinaceæ.* One Mexican per. herb sometimes grown under glass or in the open in warm regions. **S. fragrans.** Sts. fleshy, hanging: lvs. oblong-lanceolate, sheathing at base, parallel-veined: fls. white, fragrant, in clusters in terminal panicles.—Makes a good basket-plant. Sometimes cult. as *Tradescantia dracænoides.*

SPLEENWORT: *Asplenium.*

SPONDIAS. *Anacardiaceæ.* Trees grown for their edible fr., with compound lvs., small polygamous fls. borne in racemes or panicles, 8–10 stamens, 4–5-celled ovary, and fleshy drupaceous fr.; about 12 species distributed in the tropics.

In regions free from frost almost any soil is suitable, although good loams give best results. Propagated by cuttings and *S. cytherea* by shield-budding.

axillaris: *S. Mombin.*

cytherea (*S. dulcis*). VI-APPLE. OTAHEITE-APPLE. AMBARELLA. Tree to 60 ft.: lvs. of 11–23 oval to oblong entire or slightly toothed lfts. to 3½ in. long: fls. whitish, in large terminal panicles: fr. orange-yellow, oval or obovoid, with large seed. Society Isls.

dulcis: *S. cytherea.*

lutea: *S. Mombin.*

Mombin (*S. lutea. S. axillaris*). YELLOW MOMBIN. HOG-PLUM. Tree to 60 ft.: lvs. of 7–17 ovate-lanceolate nearly entire lfts. to 4 in. long: fls. yellowish-white, in large terminal panicles: fr. yellow, ovoid, with large seed. Cosmopolitan in tropics.

purpurea. PURPLE OR RED MOMBIN. SPANISH-PLUM. Tree to 30 ft.: lvs. of 7–23 oblong entire or slightly toothed lfts. to 1½ in. long: fls. purple or greenish, in small axillary panicles: fr. yellow to deep red, obovoid, with large stone. Trop. Amer.

Solandri: *Pleiogynium Solandri.*

SPORANGIUM: a spore-case; a sac bearing spores.

SPORE: a simple reproductive body, usually composed of a single detached cell, and containing no embryo; term employed particularly (in systematic botany) in the pteridophytes and lower orders.

SPRAGUEA. *Portulacaceæ.* Per. herbs of W. N. Amer., with mostly basal fleshy lvs. and fls. in umbels composed of scorpioid spikes borne on scape-like peduncles; suitable for the rock-garden.

umbellata. To 1 ft.: lvs. spatulate: fls. white or pinkish. Mts., B. C. to Calif.

SPREADING: standing outward, or horizontally away from the axis.

SPREKELIA. *Amaryllidaceæ.* One Mexican bulbous herb grown in the greenhouse and out-of-doors in warm climates; it is half-hardy. **S. formosissima** (*Amaryllis formosissima*). JACOBEAN- or ST.-JAMES-LILY. To 1 ft.: lvs. linear, with fls.: fls. bright crimson, to 4 in. long, the 3 upper segms. erect and narrow, the 3 lower ones rolled into horizontal cylinder for part of their length; spring and summer. For cult. see *Amaryllis.*

SPRING BEAUTY: *Claytonia.*

SPRUCE: *Picea.* **Bigcone-:** *Pseudotsuga macrocarpa.* **Hemlock-:** *Tsuga.*

SPUR: a tubular or sac-like projection from a flower, as of a petal or sepal; it usually secretes nectar.

SPURGE: *Euphorbia, Pachysandra.*

SPURRY: *Spergula sativa.*

SPYRIDIUM. *Rhamnaceæ.* Australian shrubs with alternate simple lvs. and fls. mostly in small sessile heads surrounded by imbricated dry brown bracts; intro. in Calif.

globulosum. Tall shrub: lvs. ovate to oblong, to 1½ in. long, leathery, white-tomentose beneath: heads almost globular, many in dense corymbs.

SQUASH. A word of American Indian origin, applied popularly to various kinds of edible fruits of the genus Cucurbita (which see). In the interest of clarity its application is sometimes limited to *Cucurbita maxima,* comprising the autumn and winter squashes such as Hubbard, Bay State, Mammoth or Chile, Warren, Essex, and the true turbans, although not so restricted by the aborigines. See *Pumpkin;* also *Eggplant* for Guinea squash.

SQUAW-BERRY: *Mitchella repens.*

SQUILL: *Scilla.*

SQUIRREL-CORN: *Dicentra canadensis.*

STACHYS. BETONY. WOUNDWORT. *Labiatæ.* Many widely distributed herbs or rarely shrubs with purplish, scarlet, pale yellow or white, 2-lipped fls. arranged in 2–many-fld. whorls, either axillary or in terminal spikes. A few species are grown for ornament in borders and one (*S. Sieboldii*) has been cult. somewhat for the edible subterranean tubers.

alpina. Per. to 3½ ft.: lvs. cordate-ovate: fls. dark purple-red. S. Eu.

annua. Branching ann. 1 ft. or less high: lvs. ovate to lanceolate, to 1½ in. long: fls. white, with yellowish under lip and throat spotted purple, about ½ in. long. Eu.

Betonica: *S. officinalis.*

ciliata. Per. to 6 ft., slightly hairy: lvs. ovate to oblong, to 6 in. long, coarsely toothed: fls. red-purple, to 1 in. long, in spikes to 8 in. long. B. C. to Ore.

coccinea. Per. to 2 ft., pubescent: lvs. ovate-lanceolate, to 2 in. long: fls. scarlet, 1 in. long. Tex., Ariz.

corsica. Procumbent ann., pubescent: lvs. ovate, ½ in. long, very obtuse: fls. pinkish-white, to ¾ in. long. Medit. region.

floridana. Per. with tuberous slender rootstocks, to 18 in., slender: lvs. oblong, to 1 in. or more, mostly cordate or rounded at base, crenate: fls. light lilac, in separated whorls. Fla.

germanica. White-woolly per. to 4 ft.: lvs. ovate-lanceolate to lanceolate, to 5 in. long, cordate at base: fls. rose-purple to white, small. Eu., Asia.

grandiflora (*S. rosea. Betonica rosea, spicata* and *grandiflora*). Hardy per. to 3 ft., pubescent: lvs. broad-ovate, the lower very long-petioled: fls. violet, 1 in. or more long. Eu., Asia Minor. Var. **robusta**, fls. rosy-pink, in spikes 3 in. long. Var. **superba**, fls. intense mauve or purple-violet, or white in the form known as *Betonica superba alba*.

lanata. LAMBS-EARS. Hardy per. to 1½ ft., densely soft-white-woolly: lvs. oblong: fls. purple, small. Caucasus to Persia.—Valuable as a bedding plant.

officinalis (*S. Betonica. Betonica officinalis*). Hardy per. to 3 ft.: lvs. ovate-oblong to oblong-lanceolate: fls. purple, ½ in. long, in dense whorls forming an oblong spike. Eu., Asia Minor.—*S. Betonica alba, albiflora* and *grandiflora* are trade forms.

rosea: *S. grandiflora.*

scardica. Sts. erect or ascending: lvs. oblong-lanceolate: fls. cream-colored suffused with rose, anthers purple, scarcely longer than calyx. Greece.

sericea. Tall herbaceous per., silky-hairy: lvs. ovate or oblong, cordate, green above, white beneath: fls. pink spotted with purple, about ½ in. long. Himalayas and N. Asia.

Sieboldii (*S. tuberifera*). CHOROGI. CHINESE or JAPANESE ARTICHOKE. KNOTROOT. CROSNES DU JAPAN. Erect, hairy, to 1½ ft., with slender knotty white tubers produced in great numbers just under the surface of the soil, edible: lvs. ovate to ovate-lanceolate: fls. small, white or light red. China, Japan.—Once intro. to this country for its edible tubers, but perhaps not now grown.

sylvatica. Per. to 2 ft.: lvs. ovate-cordate, to 4 in. long: fls. purple with lip white-spotted, ½ in. long. Eu., N. Asia.

tmolea. Per. to 1 ft.: lvs. lanceolate or oblong-lanceolate, to 3 in. long: fls. yellow. Mt. Tmolus region, Asia Minor.

tuberifera: *S. Sieboldii.*

STACHYTARPHETA. *Verbenaceæ.* Trop. herbs or shrubs with opposite or alternate toothed lvs. and white, blue, purple or red fls. borne in spikes. The name Stachytarpheta is conserved by the International Rules as against *Valerianoides.*

indica: *S. jamaicensis.*

jamaicensis (*S. indica*). Ann. to 4 ft. or subshrubby: lvs. oblong or oval, to 3 in. long: fls. blue, ¼ in. across, in spikes to 1½ ft. long. Widely dispersed in tropics.

STACHYURUS. The only genus of *Stachyuraceæ.* Asian shrubs or trees with alternate toothed lvs., yellowish fls. in drooping axillary racemes in early spring before the lvs., and berry-like frs.

chinensis. Very similar to *S. præcox* but with more acuminate lvs., spreading fls., longer style, and smaller frs. China.

præcox. Shrub to 12 ft.: lvs. ovate or ovate-lanceolate, to 5½ in. long: fls. bell-shaped, ⅓ in. long, in racemes to 3 in. long: fr. greenish-yellow, ⅓ in. across. Japan.

STAFF-TREE FAMILY: *Celastraceæ.*

STAGGER-BUSH: *Lyonia mariana.*

STAGGERWEED: *Delphinium tricorne.*

STALK: the stem of any organ, as the petiole, peduncle, pedicel, filament, stipe.

STAMEN: the pollen-bearing or male organ.

STAMINATE: having stamens and no good pistils; male.

STAMINODE, STAMINODIUM: a sterile stamen or a structure resembling such and borne in the staminal part of the flower; in some flowers (as in Canna) staminodia are petal-like and showy.

STANDARD: the upper and broad more or less erect petal of a papilionaceous or pea-like flower.

STANHOPEA. *Orchidaceæ.* Epiphytic orchids native in trop. Amer., having pseudobulbs with 1 large leathery lf. and large fragrant odd fls. borne on 2–10-fld. scapes which go through the potting material and appear at bottom of the orchid-basket, the sepals and petals reflexed, the lip saccate at base, with 2 lateral horns in center, the front lobe keeled. For cult. see *Orchids.*

Amesiana: *S. Lowii.*

devoniensis. Lvs. to 1 ft. long and 3 in. wide: fls. 4 in. across, 2–3 together; sepals and petals pale yellow thickly spotted with red; lip whitish dotted with purple with 2 purple spots at base, July–Aug. Mex.

insignis. Lvs. broadly lanceolate: fls. 5 in. across, in 2–3-fld. racemes to 10 in. long, yellowish-white spotted with purple, Aug.–Oct. Peru.

Lowii (*S. Amesiana*). Fls. buff spotted with brown, the lip ivory-white. Colombia.

oculata. Lvs. ovate, to 1 ft. long: fls. 5 in. across, in 4–10-fld. racemes to 14 in. long, pale yellow spotted with violet, the lip with 2 dark purple spots at base, the horns white, July–Oct. Mex.

Reichenbachiana. Fls. shining white with rose on lip and yellowish sepals and petals. S. Amer.

tigrina. Fls. to 7 in. across, in 2–4-fld. racemes, yellow spotted with violet, the lip tipped with white, Aug.–Nov. Mex.

Wardii. Fls. in 6–10-fld. racemes to 16 in. long, orange-yellow spotted with purple, cavity of lip dark velvety-purple, July–Sept. Guatemala, Venezuela. Var. **aurea** is a color form.

STANLEYA. *Cruciferæ.* Tall glaucous and glabrous per. herbs of W. N. Amer., one sometimes grown for ornament in regions like those to which it is native: lvs. lobed, entire or divided: fls. yellow, in terminal racemes, the petals and sepals very narrow: fr. an elongated pod or silique. **S. pinnata.** Cleome-like, to 5 ft., with lvs. variously pinnately divided and upper ones entire: fls. golden-yellow, in a long terminal spike-like raceme. S. D. to New Mex. and Calif.

STANLEYELLA: *Thelypodium Wrightii.*

STAPELIA. CARRION-FLOWER. *Asclepiadaceæ.* Somewhat cactus-like leafless plants with thick fleshy 4-angled sts., large grotesque wheel- or bell-shaped fls. barred with dull colors and usually with offensive odor, and spindle-shaped frs.; African.

Stapelias are grown in greenhouses in open porous sandy soil which is well drained. They should remain dormant in winter. Propagated by cuttings. Many kinds are known to collectors of succulents.

Corderoyi: *Duvalia Corderoyi.*

gigantea. Sts. to 9 in. long: fls. brown-purple and hairy with under color of buff and lines of brown-purple, 11 in. across, 1–2 together at base or middle of sts., in summer. Trop. and S. Afr.

variegata. Sts. to 6 in. long: fls. greenish-yellow with dark purple-brown spots, 3 in. across, 1–5 together at base of sts. S. Afr.

STAPHYLEA. BLADDER-NUT. *Staphyleaceæ.* Shrubs or small trees bearing opposite compound lvs., bisexual white fls. in terminal panicles, and bladder-like frs.; grown for ornament, the following species hardy in the N. (unless noted) and blooming in early summer.

Bladder-nuts prefer partial shade and moist rich soil. Propagated by seeds sown when ripe or stratified till spring, by suckers, layers and cuttings; greenwood cuttings taken from forced plants will root readily.

Bolanderi. Much like *S. trifolia* but lfts. broader and glabrous, fr. somewhat larger. Calif.

Bumalda. To 8 ft.: lfts. 3: fls. about ⅓ in. long, in erect panicles to 3 in.: fr. to 1 in. long. Japan.

colchica. To 12 ft.: lfts. 5 or sometimes 3: fls. to ¾ in. long, in erect or nodding panicles to 3 in. long: fr. to 4 in. long. Caucasus. Var. Colombieri is more vigorous, with larger lvs. and fr.

emodi. Related to *S. trifolia*, not hardy N., with larger finely serrulate lfts. that are less pubescent underneath, and larger fls. and frs.. Himalayas.

holocarpa. To 25 ft. or more: lfts. 3: fr. ellipsoid or pyriform, to 2 in. long. China.

pinnata. European B. To 15 ft.: lfts. 5–7: fls. ½ in. long, in nodding panicles to 5 in. long: fr. to 1½ in. long. Eu., W. Asia.

trifolia. American B. To 15 ft.: lfts. 3, pubescent underneath: fls. about ⅓ in. long, in nodding panicles to 2 in. long: fr. to 3 in. long. E. U. S.

STAPHYLEACEÆ. Bladder-Nut Family. Five widely distributed genera of trees and shrubs with compound lvs., bisexual regular fls. having 5 sepals, petals and stamens, usually 3-celled ovary, and capsular fr. sometimes much inflated. Staphylea is much planted in N. Amer. for ornament, and Euscaphis more rarely.

STAR-APPLE: *Chrysophyllum Cainito.* **-Glory:** *Quamoclit.* **-Grass:** *Aletris, Hypoxis.* **Mexican:** *Milla biflora.* **-of-Bethlehem:** *Ornithogalum umbellatum.*

STARFLOWER: *Trientalis.* **Spring:** *Brodiæa uniflora.*

STARWORT: *Aster.*

STATICE (*Armeria*). Sea-Pink. Thrift. *Plumbaginaceæ.* Dwarf perennials with narrow evergreen lvs. in tufts or basal rosettes, fls. in heads on wiry sts. blooming early spring to late autumn. True statices with globular heads are little cult., most of the plants known as Statice being Limonium, which see.

Thrifts are useful as edging plants in the border and rock-garden, and are sometimes grown as pot-plants. They may be used in dry bouquets. They succeed in any soil, and are mostly very hardy. Propagated by seed or by division of the stools.

alpina. To 6 in. and more: lvs. linear: fls. deep rose, in heads to ¾ in. across. Alps, Pyrenees.

arborea: *Limonium fruticans*, but the plant usually cult. under this name is *L. macrophyllum.*

Armeria (*A. vulgaris. A. maritima*). Common T. To 1 ft. or more high: lvs. linear: fls. white (alba), rose (rosea), purple, in heads to 1 in. across. Eu., N. Amer., Chile. Vars. **Laucheana** and **splendens** have rose fls.

cæspitosa. To 2 in., densely tufted: lvs. linear, very short: fls. pale lilac or pink, in small nearly sessile heads. Mts. of Spain and Portugal.

canescens. To 1 ft. or more: lvs. linear, pale green: fls. in large heads. E. Eu.

fasciculata. Shrubby at base: lvs. linear, glaucous: fls. pale pink. Spain, Corsica, Sardinia.

incana: *Limonium tataricum* var. *angustifolium.*

Laucheana: *S. Armeria* var.

Limonium: *Limonium vulgare.*

majellensis. Tufted: lvs. broad-linear, short, the margins cartilaginous: fls. in large heads. Italy.

mauritanica. Lvs. oblong-ovate, glaucous, with dry white margins: fls. pink, in heads to 3 in. across. Eu., Algeria.

plantaginea. To 2 ft.: lvs. linear-lanceolate: fls. white, pink or red, in heads 1 in. across. Eu. Var. **gigantea** is 3 ft. high.

pseudo-Armeria (*A. cephalotes*). To 1½ ft., glaucous: lvs. oblong-lanceolate: fls. bright pink, in heads to 2 in. across. S. Eu. Var. **rubra** has rosy-red fls.

Welwitschii. Somewhat shrubby: lvs. linear: involucral lvs. brownish margined with white. Portugal.

STAUNTONIA. *Lardizabalaceæ.* Woody evergreen climbers native in China and Japan, with digitately compound lvs., unisexual fls. in axillary racemes, and fr. a berry.

They thrive in moist shady locations in soil rich in humus, and hardy in southern United States. Propagated by cuttings of half-ripened wood under glass.

coriacea: a listed name.

hexaphylla. To 40 ft.: lvs. of 3–7 ovate lfts. to 4 in. long: fls. white tinged violet, fragrant, about ¾ in. long. Japan.

STEEPLEBUSH: *Spiræa tomentosa.*

STEIRONEMA. Loosestrife. *Primulaceæ.* N. American per. herbs with yellow fls. borne singly or in axillary clusters, the corolla wheel-shaped. Cult. as for *Lysimachia.*

ciliatum (*Lysimachia ciliata*). To 4 ft.: lvs. opposite, ovate-lanceolate, to 6 in. long: fls. to 1 in. across. U. S.; nat. in Eu.

STELLARIA. *Caryophyllaceæ.* Herbaceous annuals and perennials usually diffuse and tufted, with simple opposite lvs. and white fls. in terminal leafy or naked cymes, rarely axillary or solitary; scattered over the world but mostly in temp. regions.

alpestris of hort. is *Silene alpestris.*

Holostea (*Alsine Holostea*). Easter Bells. Per., erect from a creeping rootstock, to 2 ft. high, glabrous or somewhat downy: lvs. lanceolate, to 3 in. long, ciliate on midvein and margins: fls. to ¾ in. across, May–June. Eu., N. Asia; escaped in E. U. S.

STEM: the main axis of a plant; leaf-bearing and flower-bearing as distinguished from the root-bearing axis.

STEMMODONTIA: *Wedelia trilobata.*

STENACTIS: *Erigeron speciosus.*

STENANDRIUM. *Acanthaceæ.* Short-stemmed herbs native of trop. Amer. and grown as foliage plants in the greenhouse: lvs. basal, entire: fls. small, in spikes: fr. a caps.

Lindenii. Lvs. broad-elliptic, dark green above veined with white or yellow, purplish beneath: fls. yellow, in spikes to 3 in. long. Peru.

STENANTHIUM. *Liliaceæ.* Tall herbs with a somewhat bulbous base and long linear lvs. borne mostly at base of st., small polygamous greenish or purplish fls. in terminal diffuse racemes or panicles, the perianth-segms. united at base; occasionally planted in the border or wild-garden.

angustifolium: *S. gramineum.*

gramineum (*S. angustifolium*). To 4 ft.: lvs. grass-like, to 1 ft. long and ¼ in. wide: fls. whitish, to ½ in. across, in panicles to 2 ft. long. S. U. S.

robustum. Feather-Fleece. To 5 ft.: lvs. to 1 ft. long and ¾ in. wide: fls. greenish or white, to ⅔ in. across, in usually compound panicles to 2 ft. and more long. Pa. to S. C. and Mo.

STENOCARPUS. *Proteaceæ.* Trees with alternate or scattered lvs., bisexual red or yellow fls. in umbels, and fr. a leathery follicle; native in Australia and New Caledonia. Grown out-of-doors in S. Calif.

Cunninghamii. Lvs. oblong-lanceolate, to 4 in. long: fls. yellowish, differing from *S. salignus* only in the glabrous ovary. N. Australia.—The plant grown in S. Calif. and figured in Bot. Mag. as *S. Cunninghamii* is *S. sinuatus.*

salignus. Lvs. ovate-lanceolate, to 4 in. long: fls. yellowish, ½ in. long, in 10–30-fld. umbels. Queensland, New S. Wales.

sinuatus. Lvs. oblong-lanceolate or pinnately cut into 1–4 pairs of oblong lobes, to 1 ft. long: fls. bright red, 1 in. long, in 12–20-fld. umbels. Queensland, New S. Wales.

STENOCHLÆNA. *Polypodiaceæ.* Trop. climbing epiphytic ferns with 1-pinnate lvs., the fertile with contracted segms. covered with sori beneath; sometimes grown in greenhouses on tree-fern sts. and other supports. See *Ferns.*

palustris. Lvs. leathery, shining, to 4 ft. long, segms. of sterile lvs. to 10 in. long and 1½ in. wide, toothed toward tip. India, S. China, Australia.

STENOGLOTTIS. *Orchidaceæ.* African terrestrial orchids with basal lvs. and small fls. in racemes, the petals narrower than sepals, the lip 3–5-cleft; grown in temperate greenhouse. See *Orchids* for cult.

longifolia. Lvs. to 7 in. long: fls. light purple spotted with darker, in many-fld. racemes to 14 in. high, the lip cut into 5–7 segms., Aug.–Oct.

STENOLOBIUM. *Bignoniaceæ.* Four erect shrubs Fla. to Mex. and S. Amer., with opposite simple or compound lvs., prominent showy fls. in racemes or panicles, corolla bell-shaped or funnelform and tube contracted at base and hairy inside toward bottom, stamens curved in two pairs, fr. a long narrow pod-like caps. bearing thin-winged seeds. One species is abundantly planted Fla. to S. Calif. and in tropics; cult. as for Tecoma and similar plants.

stans (*Bignonia* and *Tecoma stans*). YELLOW-ELDER. To 20 ft. or more, sometimes tree-like: lvs. pinnate, of 5–13 lanceolate to oval lfts. that are to 4 in. long, acute or acuminate, serrate, glabrous: fls. bright yellow, to 2 in. long: fr. to 8 in. long. Fla. to S. Amer. Var. **angustata,** lfts. narrow and cut-toothed. Var. **velutina** (*Tecoma velutina, T. mollis*), lfts. pubescent underneath.

STENOSPERMATION. *Araceæ.* Shrubs climbing by roots from the nodes, native in the Andes of S. Amer.: lvs. with long-sheathed petioles: spathes boat-shaped, white, soon deciduous; spadix white; fls. bisexual. One species sometimes grown in greenhouses.

popayanense. Sts. to 3 ft. long: lvs. oblong or oblong-lanceolate, to 1 ft. long and 2½ in. wide, leathery: spathe 4 in. long; spadix 2¼ in. long. Colombia, Ecuador.

STENOTAPHRUM. *Gramineæ.* Creeping per. grasses, one of which is used for lawns in the S.: lvs. narrow: spikelets sunken in the flattened rachis of the spike; native in tropics and subtropics. See *Grasses, Lawns.*

secundatum. ST.-AUGUSTINE-GRASS. Stoloniferous, sts. to 1 ft. high, with flattened sts.: lvs. to 6 in. long and ⅓ in. wide: spikes stiff, to 5 in. long. S. C. to Tex., trop. Amer. Var. **variegatum** has white striped lvs.

STEPHANANDRA. *Rosaceæ.* Asian deciduous shrubs with alternate toothed or lobed lvs., small white or greenish fls. in terminal panicles or corymbs. and fr. only partly dehiscent.

The following are hardy in the North although requiring protection in severe winters. Propagated by seeds, by cuttings of green wood under glass, by division, and sometimes by root-cuttings.

flexuosa: *S. incisa.*

incisa (*S. flexuosa*). To 8 ft., with long drooping branches: lvs. to 2½ in. long, deeply lobed sometimes halfway to midrib: stamens 10. Japan, Korea.

Tanakæ. To 6 ft.: lvs. to 4 in. long, shallowly 3-lobed: stamens 15–20. Japan.

STEPHANOMERIA. *Compositæ.* Ann. and per. chicory-like herbs of W. N. Amer. with lvs. reduced on the flowering branches and rose or pink heads of ligulate fls. borne in panicles and opening only in early morning; pappus of plumose bristles. One species occasionally transferred to the garden.

cichoriacea. Per. to 5 ft., with woody root: lvs. oblong to lanceolate, to 8 in. long: heads ¾ in. across, sessile on the naked branches. Calif.

STEPHANOPHYSUM: *Ruellia.*

STEPHANOTIS. *Asclepiadaceæ.* Woody vines of Madagascar and Malaya, with opposite leathery lvs., large funnel- or salver-shaped fls. in axillary clusters, and thick milkweed-like frs.; grown under glass or out-of-doors in this S., in loamy soil in a temperature of about 65°. Propagated by cuttings of half-matured wood over bottom heat.

floribunda. MADAGASCAR-JASMINE. To 15 ft. and more, twining: lvs. elliptic, thick, to 4 in. long, with abrupt short apex and broad or subcordate base: fls. white, waxy, fragrant, 1–2 in. long. Madagascar.

STERCULIA. *Sterculiaceæ.* Trop. trees with alternate entire or palmately lobed and divided lvs., unisexual or polygamous fls. without petals usually in axillary panicles, and fr. of 5 woody carpels; planted for shade and ornament in trop. climates. Propagated by seeds and cuttings of ripened wood.

acerifolia: *Brachychiton acerifolium.*

alata: *Pterygota alata.*

apetala (*S. carthaginensis*). To 45 ft.: lvs. thick, 5 lobed, to 1 ft. broad, pubescent or tomentose underneath: fls. yellow spotted with pink or purple, rusty-tomentose: fr. to 4 in. long. Trop. Amer.

Bidwilli: *Brachychiton Bidwilli.*

carthaginensis: *S. apetala.*

discolor: *Brachychiton discolor*

diversifolia: *Brachychiton populneum.*

fœtida. To 60 ft.: lvs. divided into 5–9 lanceolate lfts. to 6 in. long: fls. red or purplish, with offensive odor: fr. red, to 4 in. long. Tropics of Old World.

Gregorii: *Brachychiton populneum* var. *occidentalis.*

lurida: *Brachychiton luridum.*

platanifolia: *Firmiana simplex.*

rupestris: *Brachychiton rupestris.*

STERCULIACEÆ. STERCULIA FAMILY. Herbs, shrubs and trees, mainly trop., on both sides of the world, differing from Malvaceæ in technical characters: genera about 50, furnishing ornamental subjects and the cocoa, chocolate and cola-nut of commerce. The family is characterized by alternate lvs., regular mostly bisexual fls. having 5 sepals and petals or petals lacking, 5 or more stamens, superior 2–5-celled ovary, and fr. a caps. or follicle which sometimes separates into leaf-like carpels. The genera herein treated are: Brachychiton, Cola, Dombeya, Firmiana, Fremontia, Mahernia, Pterospermum, Pterygota, Sterculia, Theobroma, Thomasia, Waltheria.

STERNBERGIA. *Amaryllidaceæ.* Bulbous herbs with narrow basal lvs. and bright yellow funnel-shaped fls., solitary or 2 terminating the short scape.

The following species is hardy and succeeds in a dry sunny position in rather heavy soil. Bulbs should be planted about 6 inches deep.

lutea (*Amaryllis lutea*). Lvs. to 1 ft. long and ¾ in. wide: fls. 1½ in. long, the tube very short, in autumn. S. Eu., Asia Minor.

STEVENSONIA. *Palmaceæ.* One monœcious somewhat armed tree from the Seychelles Isls., with pinnate-ribbed lvs. not parted or cut to the rachis or midrib: related to Verschaffeltia but differs in absence of brace roots, lvs. with long sharp teeth or secondary segms., smaller drupe-like fr., seed not grooved, 2 spathes, and technical characters: spadices in axils of lower lvs., much branched, drooping; spathes 2, the outer one bristly; fls. in 3's, spiral on the branches, middle one pistillate; stamens 15–20, joined at base: fr. flattened on one side, about ⅓ in. long; albumen strongly ruminate. Probably too tender for the open ground in the U. S.

S. Borsigiana (*S. grandifolia. Phœnicophorium sechellarum*). To 40 or 50 ft., st. spiny in young plants but becoming spineless, the lf.-sheaths and petioles spiny when young: lvs. obovate or oblong, cuneate at base, blade several ft. long, shallowly bifid at apex, deeply cut along the sides mostly one-third or less to rachis, the parts or segms. cut, strongly ribbed, more deeply cut on old trees: fls. golden-yellow.

STEVIA. *Compositæ.* About 100 species of herbs, sometimes woody at base, Tex. to Ariz. and to S. Amer., with mostly opposite lvs. and small narrow often brightly colored few-fld. heads, purple to white, in terminal clusters. Little grown for ornament.

ivæfolia. Per. with stout roots and somewhat woody base, to 18 in. or more, erect: lower lvs. broad-spatulate, about 1 in. long, finely serrate; upper lvs. narrow-oblong to linear: fls. dark rose. Mex. south.—Probably a form of *S. serrata* which is not in cult., the *Stevia serrata* of florists being *Piqueria trinervia.*

purpurea. Lvs. very narrow, the lower ones hardly spatulate: fls. purple. Mex.

serrata: see under *S. ivæfolia.*

STEWARTIA (sometimes but not by Linnæus spelled *Stuartia*). *Theaceæ* or *Ternstrœmiaceæ.* Asian and N. American trees and shrubs with alternate simple toothed lvs., showy white fls. solitary in the axils, and capsular fr.

Stewartias are planted for ornament and are fairly hardy North. A mixture of peat and loam soil is best. Propagated by seeds, layers, and cuttings under glass in late summer.

Malacodendron (*S. virginica*). Shrub to 12 ft.: fls. to 4 in. across, with purple stamens; styles united. Va. to Fla. and La.; not hardy in northern states.

monadelpha. Tree to 80 ft.: fls. 1½ in. across, with violet anthers; bracts beneath calyx large and leaf-like; styles united. Japan.

pentagyna (*Malachodendron pentagynum*). Shrub to 15 ft.: fls. to 3 in. across, having white stamens with orange anthers; styles distinct. Ky. to Ga.

Pseudo-Camellia (*S. japonica* var. *grandiflora*). Shrub or tree to 50 ft.: fls. to 2½ in. across, having white stamens with orange anthers; bracts small; styles united. Japan.

sinensis. Shrub or tree to 30 ft.: fls. 2 in. across, with whitish stamens; bracts longer than calyx; styles united. China.

virginica: *S. Malacodendron.*

STICK-TIGHTS: *Bidens.*

STIGMA: the part of the pistil that receives the pollen, commonly at the tip of the style and variously enlarged.

STIGMAPHYLLON (*Stigmatophyllon*). *Malpighiaceæ.* Woody vines, usually twining, from trop. Amer., with opposite simple lvs., yellow fls. in umbel-like corymbs, and fr. of 1–3 samaras; grown out-of-doors in warm regions, also sometimes in the greenhouse where they are propagated by cuttings in heat.

ciliatum. Slender twiner: lvs. glabrous, the margins ciliate: clusters with 3–6 showy fls. St. Thomas (W. Indies), S. Amer.

littorale. Robust, with tuberous roots: lvs. glabrous above, pubescent beneath: clusters many-fld. Brazil.

STILBOCARPA. *Araliaceæ.* Large herbs of New Zeal. and adjacent isls., sometimes grown under glass or in the open in warm climates: lvs. large, simple: fls. unisexual, in compound umbels forming large globose heads.

Lyallii. To 4 ft.: lvs. orbicular-reniform, lobed and toothed, to 1½ ft. across, glabrous above, bristly-hairy beneath: fls. reddish-purple, in heads to 1 ft. across: fr. black and shining.

polaris. Differs from *S. Lyallii* in lvs. bristly on both surfaces, yellowish fls. with purplish center, and fr. hollowed at apex.

STILLINGIA: *Sapium sebiferum.*

STINK BELLS: *Fritillaria agrestis.*

STIPA. SPEAR-GRASS. FEATHER-GRASS. *Gramineæ.* Rather tall per. grasses with mostly convolute lvs. and small awned spikelets borne in panicles; widely distributed and grown for ornament and *S. tenacissima* for fiber. See *Grasses.*

elegantissima. To 3 ft.: panicles to 8 in. long, open, with awns to 1¼ in. long and plumose pedicels. Australia.

pennata. Tufted, to 3 ft.: panicles dense, with plumose awns to 1 ft. long. Eu., Asia.

tenacissima. ESPARTO-GRASS. To 3 ft.: panicles short, with plumose awns to 2 in. long. Spain, N. Afr.

STIPE: the stalk of a pistil or other small organ; also the petiole of a fern leaf.

STIPULE: a basal appendage of a leaf, usually on the petiole or at its insertion; the three parts of a complete leaf are blade, petiole, stipules (usually 2). *Stipel* is the stipule of a leaflet.

STIZOLOBIUM. VELVET BEAN. *Leguminosæ.* Ann. extensive twiners with lvs. of 3 large lfts., papilionaceous fls. in long racemes, and mostly thick hairy or velvety pods; grown for forage far S. and also for ornament.

Velvet beans are adapted only to warm regions and will not stand frost. They should be planted with some supporting crop, such as corn. Propagated by seeds.

Deeringianum (*Mucuna Deeringiana*). FLORIDA VELVET B. Fls. dark purple: pods to 3 in. long, covered with dense black pubescence; seeds nearly globular, whitish spotted with brown and black. Probably S. Asia or Malaya.

Hasjoo. YOKOHAMA BEAN. Fls. dark purple: pods to 4½ in. long, with white pubescence; seeds somewhat flattened, ash-colored. Probably Japan.

niveum. Lyon Bean. Fls. white: pods to 5 in. long, with white pubescence; seeds flattish, ash-colored. Probably S. Asia and Philippines.

pruritum. Cowage. Cowitch. Fls. dark brownish-purple: pods to 4 in. long, bristly-hairy; seeds oblong, spotted. Tropics.

STOCK (*Mathiola* and *Malcomia*). Three unlike plants comprise the stocks of gardeners. The evening stock, grown for its very fragrant lilac or light purple small flowers that open toward night, is a straggling branchy annual with very narrow leaves, native in south-eastern Europe, named *Mathiola bicornis* from the two conspicuous horns on the end of the mature pods; flowers sessile. The Virginian stock, annual, grown for its abundant small not fragrant flowers in lilac, red and white, is *Malcomia maritima* which see; pod not horned; flowers short-stalked.

The third kind is the common or Brampton stock of the florists and flower-gardens; it is biennial or perennial, *Mathiola incana*, with an annual race known as ten weeks stock, var. *annua*; there are intermediate races; it is native in southern Europe. It is a sturdy erect felty plant, 1–2½ feet high, with colors in cultivation running from white to pink, red, purple, terracotta, yellowish, very fragrant, usually double. There are dwarf compact races. It is grown for summer and autumn bloom in the open, and also under glass; a standard garden flower for beds, borders, bouquets and floral decorations.

The annual or ten weeks stock is grown for summer and autumn flowers from seeds started in late winter or very early spring or sometimes later for autumn use. Transplant as needed to maintain continuous growth and to produce stocky plants, letting them stand 8–10 inches apart. They make good house subjects in pots, from seeds sown in summer. Usually handled as a half-hardy subject.

The intermediate stock requires a longer season; sown at the same time as the ten weeks, it succeeds that kind in bloom. The intermediate kinds are hardier and may be expected to bloom up to cold weather. For spring bloom, the hardy biennial strains are employed, the seeds being sown the spring or summer before and the plants carried over winter in a cool house or frame; or they may be lifted in autumn and potted for winter bloom. Special colors are sometimes perpetuated by cutting propagation. Stocks are often grown by florists in beds under glass, for spring sale. For this purpose, seeds may be started in late autumn and early winter. See *Mathiola*.

STOKESIA. Stokes Aster. *Compositæ.* One per. herb native from S. C. to La. and planted in the garden. It thrives in well-drained sandy loam, but requires protection N. Propagated by seeds and division. **S. lævis** (*S. cyanea*). Sts. woolly or flocose above: lvs. oblong-lanceolate, to 8 in. long, spiny-toothed toward base: heads to 4 in. across, blue or purplish-blue, the marginal fls. enlarged; pappus of scales; July–Oct. Vars. **alba,** white, **lutea,** creamy-yellow, and **rosea,** pink, are listed.

STOLON: a shoot that bends to the ground and takes root; more commonly, a horizontal stem at or below surface of the ground that gives rise to a new plant at its tip.

STOMATIUM: a segregate from *Mesembryanthemum*; see *M. agninum.*

STOMOISIA: see *Utricularia.*

STONECROP: *Sedum.*

STONEFACE: *Lithops.*

STONE-FRUITS: *Prunus.*

STONE-ROOT: *Collinsonia.*

STORAX: *Styrax.*

STORKSBILL: *Pelargonium.*

STRANVÆSIA. *Rosaceæ.* Asian evergreen trees and shrubs with alternate simple lvs., white fls. in terminal clusters, and fr. a small red or orange pome; grown in S. U. S. Propagated by seeds or cuttings of half ripe wood under glass.

Davidiana. To 20 ft. or more: lvs. oblong, to 4 in. long, entire: fls. ⅓ in. across, the corymbs to 4 in. wide. China. Var. **salicifolia** (*S. salicifolia*) has narrow lanceolate lvs. Var. **undulata** (*S. undulata*) has lvs. wavy at margins.—Stands in D. C.

glaucescens: *S. Nussia.*

Nussia (*S. glaucescens*). Small tree: lvs. obovate, to 5 in. long, finely toothed: fls. ½ in. across, in corymbs to 5 in. wide. Himalayas.

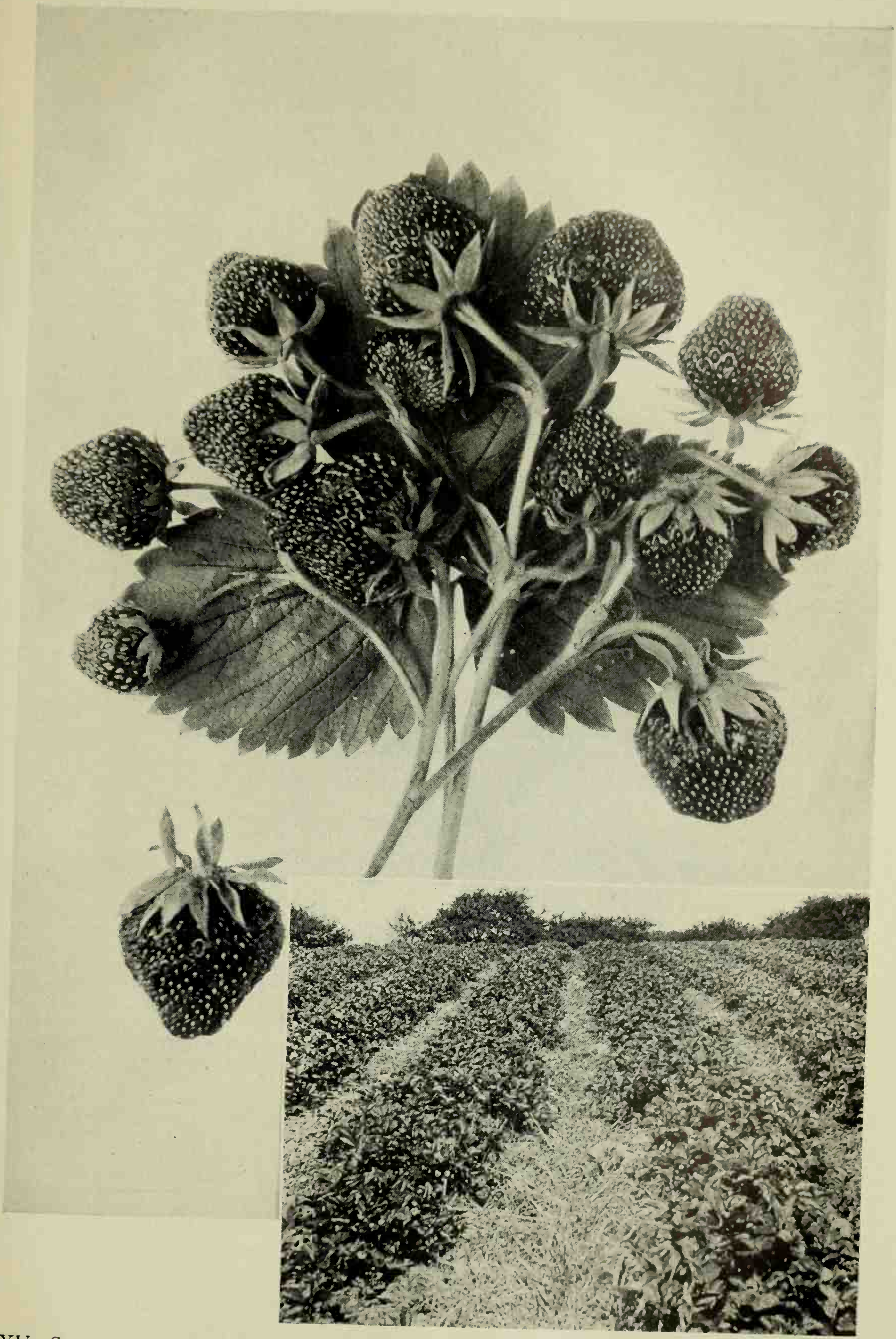
salicifolia: *S. Davidiana* var.

undulata: *S. Davidiana* var.

STRATIOTES. Water-Soldier. *Hydrocharitaceæ.* One European per. aquatic herb, sometimes planted in ponds. **S. aloides.** Sts. very short: lvs. submerged, linear-lanceolate, fleshy, edged with pointed spiny teeth: fls. unisexual, white, on peduncles rising above water.—Propagated by side shoots from base of lvs.

STRAWBERRY (*Fragaria*, probably mostly derived from *F. chiloensis*). Perennial herbs, grown for the large red fruit, which is structurally an enlarged fleshy receptacle with many seeds imbedded in it: these "seeds," however, are the true fruits in a botanical sense, or achenes, the seed being inside the thin integuments. In some varieties the stamens are not sufficiently developed to insure pollination; they are often listed as "pistillate" although the denomination is not strictly correct. Varieties with such imperfect flowers should be planted not more than two rows together, the rows next them being strong pollen-bearers. Although perennial, strawberries do not bear good crops indefinitely. Usually they may be fruited two or three times, but on fertile land and with extra good care the first crop (the year after setting) may be very heavy and the patch may then be plowed or spaded up. To mainmain a continuous good supply a new patch should be set not less than every other year.

In some of its varieties the strawberry can be grown throughout the United States, in most parts of Canada and in parts of Alaska. It thus has a wider distribution than any



XV. Strawberry. — Cluster of the Chesapeake strawberry; a good strawberry field with plants in matted rows and mulch between

other temperate-zone fruit. Most varieties reach their best development on sandy soils although some, such as Aroma and Gandy, are best suited to the heavier silt and clay loams. A good humus supply is of advantage, and drainage is essential.

Propagation is by new plants formed on runners which, with most varieties, are produced abundantly in the growing season. In the nursery, plantations are set for the production of plants alone, the blossoms being removed. In the home garden, new plantings can be set with young plants from the old bed. Commercial growers usually set nursery-grown plants. The time of setting strawberry plants varies in different climates. In the northern states early spring is the usual time. In the South, fall planting is of advantage, being governed by the time of the desired fruiting season. The plants are set so that the crowns are just level with the surface of the ground, and the soil is well firmed about the roots.

As to the methods of culture, so much depends on the size of the plot, the purpose for which the fruit is wanted, and the amount of care one is willing to give, that no set rule can be stated for a garden in which but few plants are grown and extra care can be given. Large fruits and a number of them may be had by growing to the single plant, keeping off all runners and relying on numerous fruit-crowns on one plant for the crop of berries. Or strawberries may be grown by the narrow matted-row or spaced-row system in which the runners, before rooting, should be turned along the rows at a distance of 4 to 6 inches from the parent plant. These runners should be the first ones made by the plant and should not be allowed to root themselves, but be set in by hand. This is not a difficult operation; and if the runners are separated from the parent plant as soon as they become well established, the drain on the plant is not great. All other runners should be cut off as they start. The row should be about 12 inches wide at fruiting time. Each plant should have sufficient feeding ground, full sunlight, and a firm hold in the soil. The broad matted-row system is most widely used in commercial plantations. The plants are set in rows 3½ to 4 feet apart, 15–30 inches apart in the rows. All runners are allowed to grow but are turned or confined to strips 18–24 inches wide.

Clean culture is necessary from the time the plants are set until they are mulched in autumn. The needed organic matter can be best supplied by heavy applications of manure with the crop, whatever it may be, the year preceding the setting of strawberries, or by turning under clover sod the previous year. On poorer lands a complete fertilizer with high nitrogen content applied when the plants are set may be profitable.

In the northern states the winter treatment of a strawberry bed should consist in covering the plants, when the ground is frozen, in late autumn, with straw or hay. Salt marsh hay, if obtainable, is the best, as few weed seeds are introduced. Cover the ground and the plants to the depth of 3 or 4 to 6 inches. As soon as growth begins in spring, rake the mulch off, allowing it to lie between the rows; or, if the ground is hard or weedy, it may be taken off the patch entirely, the ground tilled, and then replaced for the purpose of holding moisture and keeping the berries clean.

Strawberries for shipment are picked with the stems attached, when well colored but still firm. The usual practice is to pick directly into the quart or pint berry boxes that will be used for shipment. For local or home use the berries are allowed to ripen on the plants. Berries should be cooled to 50°F. as soon as possible after picking and shipped in iced cars. Yields vary with variety and care. Three thousand quarts to the acre is a good average, although twice or three times that yield is possible.

Varieties should be chosen with reference to soil and climate. Varieties now popular are named in order of ripening.

Hardy varieties for planting in cold regions: Beder Wood, Lovett, Dunlap, Pocomoke, Crescent, Dakota.

Varieties for the northern states and Atlantic coast: Howard 17, Dunlap, Marshall, Glen Mary, Parsons, Big Joe, Chesapeake, Gandy, Sample, Late Stevens.

Varieties for Florida and the Gulf states: Klondike, Missionary, Aroma.

Varieties grown on the Pacific coast: Clark, Dollar, Magoon, Marshall, Oregon, Wilson, Nich Ohmer.

Everbearing varieties: Progressive, Superb, Americus, Minnesota No. 1017, Advance, Peerless, Mastodon.

The hautbois, alpine, and perpetual strawberries are forms of *Fragaria moschata* and *F. vesca* of Europe and are seldom grown in North America, being sometimes seen only in gardens of amateurs.

Although many pests and diseases may cause serious damage, it is usually possible to grow strawberries for home use without spraying, particularly if the rotation is short. The commercial grower should spray to meet his special problems. It is important from the standpoint of disease and pest control to keep the plants vigorous by good cultural practice. Leaf-spot is generally the most troublesome disease. It is kept in check by bordeaux or other sprays applied before blossoming and twice after harvest.

STRAWBERRY, BARREN-: *Waldsteinia fragarioides.* **-Bush:** *Euonymus americanus* and *obovatus.* **Indian-:** *Duchesnea.* **Mock-:** *Duchesnea.* **-Tree:** *Arbutus Unedo.*

STRAWFLOWER: *Helichrysum bracteatum.*

STRELITZIA. BIRD-OF-PARADISE FLOWER. *Musaceæ.* S. African per. herbs sometimes with woody trunks, banana-like lvs. and irregular bisexual fls. borne in rigid boat-like bracts, 2 of the 3 petals united to form an arrow-shaped body or "tongue".

Several species are suitable for warm climates or under glass in tubs with a night temperature of 50°: plants make clumps. Propagated by suckers and division.

augusta. To 18 ft., with trunk: lvs. to 4 ft. long and 2 ft. wide, with deeply wing-channeled petiole: fls. white, the purplish bracts to 15 in. long.

Nicolai. Resembling *S. augusta* but much larger and tree-like and fls. with blue tongue.

parvifolia. Trunkless: lvs. to 9 in. long and 3 in. wide: fls. bright orange with blue tongue, bracts green edged with red, to 6 in. long.

Reginæ. To 3 ft., trunkless: lvs. to 1½ ft. long and 6 in. wide: fls. yellow with dark blue tongue, the purplish bracts to 8 in. long.

STREPTOCARPUS. CAPE-PRIMROSE. *Gesneriaceæ.* Stemless herbs native in S. Afr. and Madagascar, with basal lvs., purple or blue scapose fls. with long tube and 2-lipped corolla-limb, and capsular frs.

Cape-primroses thrive in a cool greenhouse and are of easy cultivation. Seeds sown in February–March should produce blooming plants the following autumn or winter. Propagated also by leaf-cuttings and division.

Dunnii. Lvs. solitary, to 3 ft. long: fls. rose or reddish, 1½ in. long, on scapes 1 ft. or more high.

kewensis. Hybrid between *S. Rexii* and *S. Dunnii:* lvs. 2–3, oblong, large, dark green: fls. mauve-purple with striped throat, 2 in. long and 1½ in. wide.

Rexii. Lvs. several, to 8 in. long: fls. blue or mauve, 1½ in. long, on scapes to 1 ft. high.

Wendlandii. Lvs. solitary, 2 ft. and more long, purple beneath: fls. violet-blue, 1 in. long and 1½ in. across, on scapes to 2½ ft. high.

STREPTOPUS. TWISTED-STALK. *Liliaceæ.* Branching per. herbs with creeping rootstocks, alternate sessile or clasping lvs., and small rose or whitish nodding axillary fls., the perianth-segms. distinct; of easy cult. in the wild-garden.

amplexicaulis: *S. amplexifolius.*

amplexifolius. To 3 ft.: lvs. to 5 in. long and 2 in. wide, glaucous beneath: fls. greenish-white, ½ in. long, 2 together: berries red. N. Amer.

roseus. To 2½ ft.: lvs. to 4 in. long and 1½ in. wide: fls. purple or rose, ½ in. long, usually solitary: berries red. E. U. S.

STREPTOSOLEN. *Solanaceæ.* One rough-pubescent evergreen shrub to 6 ft. high, native in Colombia and Ecuador. S. Jamesonii (*Browallia Jamesonii*). Lvs. oval, to 1½ in. long, entire: fls. orange-red, with tube to 1¼ in. long, and spreading 5-lobed limb, borne in clusters at the end of flexuose branches: fr. a leathery caps.—A popular greenhouse plant and grown out-of-doors in S. U. S. Propagated by cuttings.

STRICT: straight and upright, little if any branched, often rigid.

STRINGYBARK: *Eucalyptus.*

STROBILANTHES. *Acanthaceæ.* Herbs or shrubs from trop. Asia: lvs. opposite: fls. tubular, constricted at base and swollen above, unequally 5-lobed, in spikes or panicles or solitary. Grown for fls. and foliage.

The following are grown under glass and require high temperatures and abundant moisture. Care must be taken or the plants may become weedy. Propagated by cuttings.

anisophyllus. Differs from *S. isophyllus* chiefly in the broader lvs. and those of each pair being unequal in size. India.

Dyerianus. Shrub: lvs. ovate-lanceolate, to 8 in. long, toothed, purple beneath, iridescent above: fls. violet, 1½ in. long, in spikes. Burma.

isophyllus. Shrub to 3 ft.: lvs. willow-like, to 4 in. long, toothed: fls. pinkish or blue and white, 1 in. long, in axillary clusters. India.—See *Ruellia malacosperma.*

STROBUS: *Pinus Strobus.*

STROMANTHE. *Marantaceæ.* S. American per. herbs with thick rootstocks, leafy sts. and fls. with colored bracts in racemes or panicles; foliage plants adapted to a warm greenhouse. For cult. see *Calathea.*

Porteana. To 6 ft.: lvs. to 1 ft. long and 6 in. broad, bright green above transversely barred with silvery-white, purple beneath: fls. blood-red. Brazil.

STROMBOCACTUS. *Cactaceæ.* A small low depressed nearly spineless cactus differing from Echinocactus in its short imbricated scale-like tubercles which are not arranged on ribs; scales on fl.-tube with papery margins: 1 species in Cent. Mex. See *Cacti.* S. disciformis (*Echinocatus disciformis* and *turbiniformis. Mammillaria disciformis*). Top-shaped or somewhat globose, to about 2 in. across, young tubercles with 1–4 white needle-like spines but old one nude: fls. from center of plant, white, red outside, about ¾ in. long.

STROMBOCARPA. *Leguminosæ.* Trees and shrubs with lvs. 2-pinnate, the lfts. being small and numerous, fls. in axillary spikes, and tightly coiled pods; furnishes forage and fuel.

odorata (*S. pubescens. Prosopis pubescens*). SCREW BEAN. TORNILLO. Spreading shrub to 15 ft. or small tree to 35 ft., with axillary spines: fls. greenish, in spikes to 3 in. long: pods to 1½ in. long. Tex., Utah, Calif.

pubescens: *S. odorata.*

STROPHOLIRION CALIFORNICUM: *Brodiæa volubilis.*

STRUTHIOPTERIS: see *Blechnum* and *Pteretis.*

STRYCHNINE: *Strychnos Nux-vomica.*

STRYCHNOS. *Loganiaceæ.* Trop. climbing shrubs and trees with opposite lvs., white to yellowish small fls. in cymes, the corolla 4–5-cleft, stamens 5, and fr. somewhat berry-like but perhaps with a hard shell; grown as drug plants and one for curiosity and the edible fr.

Nux-vomica. STRYCHNINE. Tree to 40 ft.: lvs. ovate, to 3½ in. long: fls. in terminal cymes 2 in. across: berry 1½ in. across, with many seeds yielding the poison strychnia. India.

spinosa. NATAL-ORANGE. Shrub to 10 ft., with spines ½ in. or more long: lvs. nearly orbicular to obovate, to 2 in. long, 5-nerved from near the base: fls. in terminal compound cymes: berry 4 in. across, becoming yellow, the seeds embedded in sweet edible pulp. Trop. and S. Afr.

STUARTIA: *Stewartia.*

STYLE: more or less elongated and often slender part of the pistil between the ovary and stigma.

STYLIDIACEÆ. STYLIDIUM FAMILY. Six genera of herbs or rarely small shrubs of the southern hemisphere, with simple lvs., bisexual or unisexual fls. having 3–7-lobed calyx, 5–10-lobed or -parted corolla, 2–3 stamens, inferior 2–3-celled ovary, and fr. a 1–3-celled caps. Only Stylidium is treated here.

STYLIDIUM. *Stylidiaceæ.* Mostly Australian herbs or subshrubs with basal or tufted lvs. and irregular fls. in racemes, panicles or cymes; rarely grown in Calif.

reduplicatum. Scapes 1–1½ ft. high: lvs. radical, linear, to 1 ft. long: fls. yellowish-white or pale pink, in a short loose raceme.

STYLOMA: *Pritchardia.*

STYLOPHORUM. *Papaveraceæ.* Per. herbs with yellow juice, pinnately cut lvs. and yellow or red fls. solitary or clustered; sometimes transplanted from the wild and of easy cult. in rich soil in partial shade.

diphyllum. Celandine-Poppy. To 1½ ft.: fls. deep yellow, to 2 in. across, in 2–4-fld. clusters, Mar.–May: caps. to 1 in. long. Pa. to Wis. and Mo.

STYLOPHYLLUM. *Crassulaceæ.* A dozen succulent perennials of Calif. and Lower Calif., allied to Cotyledon: rootstock woody and commonly branching: lvs. linear and long, mostly terete, sometimes with broadened base in the rosettes, those on st. sessile: fls. white, red or yellowish, bell-shaped and not angled, the petals united below: carpels 5 and mostly spreading.

densiflorum. Making dense clumps, very glaucous: lvs. many, nearly terete, to 4 in. or more long: fls. white or pinkish, about ¼ in. long, in cyme. S. Calif.

STYRACACEÆ. Storax Family. Trees and shrubs of wide distribution in Old and New World, containing 6 genera: lvs. alternate, simple: fls. regular and bisexual, having 4–5-lobed calyx, 4–8 petals united at base, 4–16 stamens, superior or partly inferior ovary: fr. a drupe or dry and dehiscent, sometimes winged. Genera grown for ornament are Halesia, Pterostyrax, Styrax.

STYRAX. Storax. *Styracaceæ.* Ornamental woody plants with showy white fls. in racemes followed by small drupaceous but sometimes dry frs. Many species in trop. and warm temp. parts of world.

Storaxes succeed in light porous soil. Few of the species are hardy North without winter protection. Propagated by seeds, layers, with difficulty by cuttings, and by grafting on other species or on *Halesia carolina.*

americana. To 10 ft.: lvs. oval or oblong, to 3 in. long, pubescent: racemes few-fld.: fr. ⅓ in. long. Va. to Fla. and La.; stands in N. Y.

californica (*S. officinalis* var. *californica*). To 8 ft.: lvs. ovate, to 2½ in. long, pubescent beneath: fls. to 1 in. long, in few-fld. racemes. Calif., where it is sometimes planted.

grandifolia (*S. grandiflora*). To 12 ft.: lvs. oval or obovate, to 7 in. long, gray-pubescent beneath: fls. fragrant, in many-fld. racemes to 5 in. long: fr. ½ in. across. Va. to Fla.; not hardy N.

japonica. To 30 ft.: lvs. oval or obovate, to 3 in. long, becoming glabrous: fls. fragrant, drooping, long-stalked, in few-fld. racemes: fr. ½ in. long. Japan, China; hardy N.

Obassia. To 30 ft.: lvs. nearly orbicular to oval, to 10 in. long, pubescent beneath: fls. fragrant, in many-fld. racemes to 8 in. long: fr. ¾ in. Japan; hardy N.

officinalis. To 20 ft.: lvs. oval or ovate, to 2½ in. long, pubescent beneath: fls. ¾ in. long, in few-fld. racemes. Eu., Asia Minor; not hardy N.

platanifolia. To 12 ft.: lvs. nearly orbicular, with wavy or slightly lobed margins, to 4 in. across, glabrous: fr. ⅓ in. long. Tex.

Wilsonii. To 10 ft., much branched: lvs. rhombic-ovate or oval, to 1 in. long, pubescent beneath: racemes few-fld.: fr. ⅓ in. long. China; not hardy N.

SUBTEND: to stand below and close to, as a bract underneath a flower, particularly when the bract is prominent or persistent; the flower is in the axil of the bract.

SUCCISA. *Dipsaceæ.* Herbs very similar to Cephalaria and Scabiosa and differing chiefly in having the scales of the receptacle about as long as fls.; native in S. Eu. and sometimes grown in the flower-garden.

pratensis (*Scabiosa Succisa*). Per. to 3 ft.: lvs. oblong, entire: fls. violet-blue, rarely white, in long-stalked heads to 1½ in. across. Eu.

SUCCORY: *Cichorium Intybus.*

SUCCULENTS. A succulent plant, or a succulent, is strictly one that is full of sap (Latin *succus*, juice, sap); but in horticultural usage it is a thick fleshy plant, and such plants are commonly juicy or sappy. What particular plants are to be included in the succulents is determined only by custom. For the most part, succulent plants are native in regions that are arid or semi-arid for at least part of the year, and the succulence has relation to water storage. It is in the study of habitats, therefore, that the gardener obtains the initial clue to the cultivation and handling of succulents.

The succulents are of many genera in many natural families. The regions they inhabit have widely different temperature characteristics. Some of the succulents, as a few sedums, are indigenous in regions of severe winter cold, with temperatures far below zero F. Mostly, however, they are natives in mild temperate and in tropical climates. They abound in the genus Mesembryanthemum (which see for culture) and segregates, in Crassulaceæ, African members of Euphorbia, in many asclepiads as Stapelia and its relatives, Liliaceæ, Amaryllidaceæ, the Kleinia section of Senecio and a few other composites, Bromeliaceæ, Portulacaceæ. In a broader sense, cacti may be included although specialists do not so classify them. In the following remarks both succulents and cacti are in mind.

Succulents and associates are prized for oddity. They are given to condensed and often to grotesque forms. Many of them have a slow-growing more or less durable body, changing little from year to year. Often the flowers are brilliant and large. All these characteristics make them interesting to fanciers. Succulents, as a class, are special horticultural subjects, prized by collectors and enthusiasts; they are therefore notable and worth the particular care they may require.

As a class these plants are not difficult to grow. Most of them need a full sun exposure; also a porous gritty soil that relieves itself of superfluous water and yet sufficiently compact and retentive to hold the moisture the plant requires. Good drainage is essential. Much fresh organic material is to be avoided in the soil. Sand, pulverized brick or rock may be added to soil to give it the proper porosity and warmth. The trouble in growing succulents is mostly in trying to raise them in moist cloudy climates to which the major part of them are not adapted; it is then that particular attention is required to make sure that they do not rot at the root from soggy and sour soil. These succulents may thrive with a minimum of attention in a region naturally adapted to them, as in central and southern California. Yet many kinds are naturally at home in humid climates, as some of the sedums, the bryophyllum, kalosanthes and other Crassulaceæ. In their growing season the succulents require plenty of moisture, as is the case where most of them grow naturally; usually there is a semi-dormant period corresponding to the dry or the cold season of their native places, and at this time they may easily be injured by thoughtless soaking. On the other hand, it is a mistake to suppose that succulents, more than other plants, can withstand dessication of the roots for any length of time. In North America the leading fleshy plants will always be cacti; one has but to observe the conditions under which they grow to apprehend the proper treatment.

The softer non-woody kinds (to which the term succulents is preferably restricted), as cotyledons, gasterias, and stapelias, are readily grown in pots in a sunny greenhouse or conservatory, the essentials being the gritty or porous soil that disposes of excess moisture, care in watering to suit the needs of the plant, and patience to allow them to come slowly and naturally to their full stature. The gardener soon learns when to keep them "slow" and when to repot and stimulate new growth. All succulents in pots make interesting subjects in the open in summer; they are not turned out of the pots but are plunged to the rims. Sometimes the roots of succulents are ruined by nematodes which are nearly or quite microscopic worms. The preventive is sterilized soil. In cold countries soil may be thoroughly frozen before employed in potting.

As succulents do not belong to one class or type of plant, so there is no single method of propagating them. Many of them make natural offsets, and multiplication is then very simple. Seeds commonly grow readily; care must be taken to prevent damping-off of the seedlings, from too wet soil; sterilized earth or clean sand or other sterile medium is advisable. In the cacti, one kind may be grafted on another with ease.

Because succulents and cacti are such striking subjects, there is temptation to make either permanent or summer plantings where they are quite out of harmony. A miscellaneous mess of succulents in the front yard may be anything but desirable or attractive; and yet the same plants placed at one side or in the rear with relationship to banks, boundaries and buildings, and properly harmonized among themselves, may be worthy of all admiration. Some of the low and tufted kinds lend themselves well to rock-gardening. The imitation of an arid or desert landscape is worth while in a dry or desert country when area is sufficient and surroundings are in keeping: this kind of landscaping is capable of distinct artistic development.

The kinds of plants known as succulents are so many and so peculiar, and the records of them have been so imperfect in herbaria, that the amateur finds a special satisfaction in making living collections and in trying to understand them. In regions like California and the Southwest succulent-gardening is likely to become an important enterprise, and it will add many plants to the North American cultivated flora. Some of them now grown by fanciers are yet unknown to general horticultural literature. The interest in succulents is represented by the Cactus and Succulent Society of America, which publishes a journal in Los Angeles.

SUFFRUTICOSE: pertaining to a low and somewhat woody plant; diminutively shrubby or fruticose; woody at base.

SUGAR-APPLE: *Annona squamosa.* **-Bush**: *Rhus ovata.* **-Cane**: *Saccharum officinarum.*

SUGARBERRY: *Celtis lævigata.*

SULCATE: grooved or furrowed lengthwise.

SUMAC: *Rhus.*

SUMMER SWEET: *Clethra alnifolia.*

SUNBERRY: *Solanum nigrum.*

SUNDEW: *Drosera.*

SUNDROP: *Œnothera.*

SUNFLOWER: *Helianthus.*

SUPPLE-JACK: *Berchemia scandens.*

SURINAM-CHERRY: *Eugenia uniflora.*

SUTERA: *Chænostoma.*

SUTHERLANDIA. *Leguminosæ.* One S. African shrub grown in the greenhouse and out-of-doors in the S. **S. frutescens.** To 3 ft., grayish-pubescent: lvs. pinnate, the lfts. numerous and small: fls. scarlet, to 1 in. long, in short axillary racemes: pods bladder-like, to 2 in. long.—Propagated by seeds and cuttings.

SUTTONIA. *Myrsinaceæ.* Shrubs or small trees with alternate entire lvs., small bisexual or diœcious fls., and fr. a small 1-seeded berry; the genus is separated from Myrsine chiefly because the petals are distinct or nearly so. Somewhat planted in Calif.

australis (*Myrsine Urvillei*). Tree to 20 ft.: lvs. oblong, to 2 in. long, wavy-margined: fls. whitish, unisexual, clustered on the branches: fr. black. New Zeal.

salicina (*Myrsine salicina*). Tree to 30 ft.: lvs. linear-oblong, to 7 in. long: fls. bisexual, clustered on the branches: fr. red. New Zeal.

SUTURE: a line or mark of splitting open; a groove marking a natural division or union; the groove lengthwise a plum or similar fruit.

SUWARRO: *Carnegiea gigantea.*

SVIDA: *Cornus.*

SWAINSONA. *Leguminosæ.* Australian herbs or subshrubs with pinnate lvs., papilionaceous fls. in axillary long-stalked racemes, and swollen pods; an old greenhouse plant, and planted out-of-doors in warm regions. Propagated by cuttings when seeds are not available.

coronillæfolia. Regarded as a violet-fld. form of *S. galegifolia.*

galegifolia. Shrub to 4 ft.: fls. deep red, not fragrant: pods to 2 in. long. Var. **albiflora** (var. *alba*) has white fls., var. **rosea** pink fls., and var. **violacea** rose-violet fls.

grandiflora: *S. Greyana.*

Greyana (*S. grandiflora*). Subshrub to 3 ft.: fls. pink: pods to 2 in. long.

SWARTZIA: *Solandra.*

SWEETBELLS: *Leucothoë racemosa.*

SWEET CICELY: *Myrrhis odorata.*

SWEET HERBS are plants of fragrant family memories. They are mostly aromatic and sweet-smelling subjects, variously employed in flavoring and seasoning and as domestic remedies. They are prevailingly of the mint and parsley families (Labiatæ, Umbelliferæ). Of the mints, the herbage is mostly the desired products; in the umbellifers, the seeds are wanted.

The sweet herbs do not constitute a single cultural group, except that they are usually only incidents to the kitchen-garden and an area 2 or 4 feet square generally yields a sufficient supply for the family. Three classes may be specified. (1) Some of them are annual and are therefore grown each year from seeds sown usually directly in the garden, as anise, coriander, saffron, summer savory, sweet basil. (2) Others are biennials and only short-lived perennials, as caraway, clary, dill, fennel, sweet marjoram. (3) The larger number are perennial, persisting for many years; they are grown from seeds or division: balm, catnip, costmary, horehound, hyssop, lavender, lovage, marjoram, pennyroyal, peppermint, rosemary, sage, tansy, tarragon, thyme, winter savory, wormwood.

SWEETLEAF: *Symplocos.*

SWEET PEA (*Lathyrus odoratus*). One hardy tendril-climbing annual, much prized for its delightfully fragrant pea-like flowers, now available in many colors and shapes of flower and in different stature of plant. The plant is grown in the open garden for summer bloom, and also under glass for winter bloom from seeds sown in September and later.

Sweet peas require deep mellow soil, early planting, heavy mulching or other means of maintaining moisture. Sow the seeds as soon as the ground is fit to work in the spring, making a drill 5 or 6 inches deep. Sow thickly and cover with 1 or 2 inches of soil. When the plants have made 2 or 3 inches growth above the soil, fill the drill nearly full, leaving a slight depression in which water may be caught. To have the ground ready in early spring, it is a good plan to trench it in the fall. The top then dries out quickly in spring and is left in good physical condition. In the middle and southern states, the seed may be planted in autumn, particularly in lighter soils. It is easy to get soils too rich in nitrogen for sweet peas; in such case, they run to vine at the expense of bloom.

If the finest flowers are wanted, do not let the plants stand less than 8–12 inches apart; provide ample support. Do not plant on the hot side of a wall or building. A succession of sowings may be made at intervals through May and June, and a fair fall crop obtained if care is taken to water and mulch; but the best results will be secured with the very early planting. After the ground is well soaked, a good mulch will hold the moisture. Do not water frequently, but thoroughly when needed. Frequent syringing with clear water will keep off the red-spider that often destroys the foliage, and attention to picking the seed-pods will lengthen the season of bloom. Provide running room, as a wire-mesh fence, and plant away from trees and bushes that have first call on moisture and fertility.

Under glass the sweet pea thrives in a cool or intermediate temperature, without particular requirements. Bloom should be obtained in winter in three months or less from the seed, depending somewhat on the proportion of sunlight and cloudiness. The seeds may be sown in rows across the bench or bed, and the vines provided with perpendicular cords or wires on which to climb.

SWEET POTATO (*Ipomœa Batatas*). A root tuber much grown in North America for food. It requires warm "quick" light but fertile land of good tilth. As a commercial crop it is largely grown in New Jersey and southward, but a home supply can be raised much farther north on warm sandy lands.

The sweet potato is grown from sprouts planted in rows, sometimes on ridges or hills, not by planting the tubers, as with the common or Irish potato. One method of obtaining these sprouts is as follows: In April, tubers are planted in a partially spent hotbed by using the whole tuber (or if a large one, by cutting it in two through the long way), covering the tubers with 2 inches of light well-firmed soil. The sash should be put on the frames and only enough ventilation given to keep the potatoes from decaying. In ten or twelve days the young sprouts begin to appear, and the bed should be watered if dry. The sprouts when pulled from the tuber will be found to have rootlets at the lower end and along the stems. These sprouts should be about 3 to 5 inches long by the time the ground is warm enough to plant them out. If two or three crops are taken, one bushel of tubers should yield 3,000 to 4,000 sprouts. The ridges, if employed, or hills should be prepared by plowing out a furrow 4 to 6 inches deep. Scatter manure in the furrow and plow back the soil so as to raise the center at least 6 inches above the level. On this ridge the plants are set, placing them well into the leaves, and about 12 to 18 inches apart in the rows, the rows being 3 to 4 feet apart.

Subsequent cultivation of sweet potatoes consists in tilling the soil between the rows; and as the vines begin to run they should be lifted frequently to prevent rooting at the joints. When the tips of the vines have been touched by frost the crop may be harvested, the tubers left to dry a few days, and then stored in a dry warm place. To keep sweet potatoes, store in layers in barrels or boxes in dry sand, and keep them in a dry room. For commercial purposes, specially constructed storage houses are built. See that all bruised or chilled potatoes are thrown out. About 100 bushels to an acre is an average yield of sweet potatoes, but three or four times this quantity is possible. Certain kinds of sweet potatoes are known as yams, but the true yam is quite a different tuber, produced by plants of the genus Dioscorea.

There are serious diseases and insects of sweet potatoes, most of which are best controlled by careful seed selection, rotation of crops, sanitary methods of propagation whereby the plants do not become infected, and the rogueing of fields for diseased plants.

SWEET-POTATO VINE, WILD: *Ipomœa pandurata.* **-scented Shrub:** *Calycanthus.* **-Shrub:** *Calycanthus.* **Spire:** *Itea virginica.* **Sultan:** *Centaurea moschata.* **William:** *Dianthus barbatus.* **William, Wild:** *Phlox divaricata.*

SWEETSOP: *Annona squamosa.*

SWERTIA: *Frasera.*

SWIETENIA. MAHOGANY. *Meliaceæ.* Trop. American evergreen trees with dark red wood which furnishes the mahogany of commerce, opposite or alternate pinnate lvs., small fls. in panicles, and fr. a very large woody caps. that splits from the base into usually 5 parts, the seeds winged at apex.

Mahagoni. Evergreen, to 75 ft.: lvs. to 1 ft. long, of 4–10 entire lfts.: fls. white: frs. to 4 in. long, the winged seeds 2 in. and more long. S. Fla. and W. Indies.—Sometimes planted for a shade and street tree.

SWINGLEA (*Chætospermum*). TABOG. *Rutaceæ.* One small spine-bearing tree in Luzon, Philippines, grown as a possible stock for citrus fruits and for general interest: lvs. evergreen, 3-foliolate: stamens 10: seeds hairy. **C. glutinosa,** with a large oval terminal lft. and 2 smaller lateral ones: fls. solitary or in clusters, on slender pedicels: fr. oblong, 2–3 in. long, thick-rinded and ribbed.

SYAGRUS. *Palmaceæ.* Mostly tree-like monœcious feather-palms of S. Amer., unarmed except perhaps on the edges of petiole, most of them in Brazil, formerly included in Cocos, distinguished from that genus and other segregates chiefly by technical characters of the fr. and seed. It agrees with Arecastrum in having the spathe deeply plicate-sulcate or grooved on the outside and in the non-ruminate albumen of the seed, but some of the species of it are small or dwarf palms much more delicate in foliage and infl. and the nutlet is prominently 3-striped, sterile cell a membranous vestige rather than a narrow area in the bony endocarp. It differs from Butia in the spathe, nutlet 1-seeded, and in the mostly naked trunk (at least below) and softer greener foliage. See *Palm* for cult.

amara: *Rhyticocos amara.*

insignis (*Cocos insignis. Glaziova insignis*). Slender, tree-like, trunk 3–8 ft., foliage spreading-recurved: lvs. to 6 ft.; petiole and sheath unarmed but bearing dark brown wool or scurf; pinnæ not aggregate, central larger ones broad-lanceolate, narrowed at base and apex, green and somewhat paler underneath: fr. about ¾ in. long, greenish with pink at apex and abrupt short point; fruiting perianth short cup-like. Rio de Janeiro.

macrocarpa (*Cocos macrocarpa. C. Procopiana*). Trunk to 15 ft. or more, ringed and cleft: lvs. 6–10 ft., petiole white-tomentose and not spiny; pinnæ green, in clusters of 4: fr. oblong and 1-seeded, large, 3½ in. long and 1¾ in. thick, greenish-yellow, with fibrous exterior; fruiting perianth somewhat cup-like with long points. Brazil.

petræa (*Cocos petræa. C. rupestris*). Small stemless palm, the caudex mostly subterranean, in several varieties: lvs. erect-spreading; petiole unarmed, white- or rusty-tomentose; pinnæ linear (very narrow, but in var. *platyphylla* somewhat broader), opposite and alternate and the lower ones 2 or 3 together: fr. oblong, about ¾ in. long, with a short point, brown, 5 or 6 or less on the spadix; fruiting perianth cup-like with sharp points. Brazil.

Weddelliana (*Cocos Weddelliana. Glaziova Martiana*). Tree-like with slender trunk to 6 or 7 ft. and foliage nearly or quite reaching the ground: lvs. slender and graceful; pinnæ linear, singly placed, long-pointed, green, paler underneath: fr. globose-oblong, about ½–⅝ in. long, with abrupt short point; fruiting perianth small, not cup-like. Rio de Janeiro.—Much used in the juvenile state as a pot plant, the pinnæ then 3–6 in. long and ¼ in. or less broad; foliage gracefully drooping.

SYCAMORE: *Ficus Sycamorus:* see also *Platanus.*

SYMMETRICAL: said of a flower that has the same number of parts in each series or circle, as 5 stamens, 5 petals.

SYMPHORICARPOS. *Caprifoliaceæ.* Deciduous shrubs with opposite simple lvs., white or pink bell-shaped or tubular fls. usually borne in clusters or spikes, and fr. a 2-seeded white or colored berry; grown for the ornamental frs. as well as the foliage and attractive habit.

These shrubs are variously hardy in the North with the exception of *S. microphyllus,* and are not particular as to soil. Propagated by seeds, cuttings, suckers and division.

acutus: *S. mollis* var.

albus (*S. racemosus*). SNOWBERRY. WAXBERRY. To 3 ft.: lvs. oval, to 2 in. long, pubescent beneath, sometimes lobed on young shoots: fls. pinkish, bell-shaped, ¼ in. long, June–Sept.: fr. snow-white. N. Amer. Var. **lævigatus.** To 6 ft.: lvs. to 3 in. long, glabrous. Var. **pauciflorus.** Low: lvs. gray-pubescent beneath: fls. few.

Chenaultii. Hybrid between *S. microphyllus* and *S. orbiculatus:* lvs. pubescent beneath: fr. red spotted whitish.

glomeratus: *S. orbiculatus.*

microphyllus (*S. montanus*). To 10 ft.: lvs. ovate, to 2½ in. long, bluish and pubescent beneath: fls. pinkish, tubular, ½ in. long, Aug.–Sept.: fr. pink. Mex.

mollis. Procumbent or diffuse: lvs. nearly orbicular to oval, to 2½ in. long, pubescent on both sides: fls. pinkish or white, bell-shaped, ⅙ in. long, June–July: fr. white. B. C. to Calif. Var. **acutus** (*S. acutus*) is less pubescent.

montanus: *S. microphyllus.*

occidentalis. WOLFBERRY. To 5 ft.: lvs. oval or ovate, to 3 in. long, grayish and pubescent beneath: fls. pinkish, bell-shaped, ¼ in. long, stamens and style exserted, June–July: fr. white. Mich. to Kans. and B. C.

orbiculatus (*S. vulgaris. S. glomeratus*). INDIAN CURRANT. CORAL-BERRY. To 7 ft.: lvs. oval or ovate, to 2½ in. long, glaucous and usually pubescent beneath: fls. white, bell-shaped, ⅙ in. long, June: fr. purplish-red. N. J. to Ga. and Tex. Var. **variegatus**

has lvs. variegated with yellow. A white-fruited form is listed.

oreophilus. To 5 ft.: lvs. oval, to 3 in. long, gray-pubescent beneath or becoming glabrous: fls. pinkish, tubular, ½ in. long, June–July: fr. white or pinkish. Ore. to Ariz.

racemosus: *S. albus.*

utahensis. To 3 ft.: lvs. broad-ovate, to 1¾ in. long: fls. pink, oblong-campanulate, ⅓ in. long: fr. white. Utah to Colo.

vaccinoides. Low, much branched: lvs. oval, to ¾ in. long, glaucous beneath: fls. pinkish, campanulate, ⅓ in. long: fr. white. Wash. to Wyo. Var. **decumbens** is decumbent.

vulgaris: *S. orbiculatus.*

SYMPHYANDRA. *Campanulaceæ.* Bien. and per. herbs resembling Campanula but differing in having the anthers united into a tube around the style. Cult. as for *Campanula.*

Hofmanni. To 2 ft., hairy: lvs. obovate, to 7 in. long, toothed: fls. white, to 1½ in. long and broad, drooping, in leafy terminal panicles, calyx without appendages. Bosnia.

pendula. To 1 ft., hairy: lvs. cordate-ovate to oblong, coarsely toothed, the lower long-stalked: fls. yellowish-white, 1¼ in. long, in racemes, the calyx with short appendages. Caucasus.

SYMPHYTUM. COMFREY. *Boraginaceæ.* Old World coarse per. herbs with alternate or subopposite and large basal simple lvs. and blue, purplish or yellowish fls. in coiled racemes or forked cymes; corolla tubular, expanded above, the throat crested.

Comfreys are sometimes planted in the border. Of easy cultivation. Propagated by seeds, division and root-cuttings.

asperrimum: *S. asperum.*

asperum (*S. asperrimum*). PRICKLY C. Per. to 5 ft.: lvs. ovate, petioled, covered with prickly hairs: fls. rose changing to blue, about ½ in. long. Russia to Persia.—Sometimes used as forage. Vars. **variegatum** and **aureo-variegatum** have lvs. variegated and margined with yellow.

officinale. COMMON C. Per. to 3 ft.: lvs. oblong-ovate to oblong-lanceolate, decurrent at base, covered with prickly hairs: fls. yellowish, purple, rose or white, about ½ in. long. Eu., Asia; escaped in N. Amer. Var. **variegatum** has lvs. margined with white; ornamental.

SYMPLOCACEÆ. SYMPLOCOS or SWEETLEAF FAMILY. Trees or shrubs, sometimes evergreen, with alternate simple lvs., mostly bisexual regular fls. having 5-lobed calyx, 5–10-lobed corolla, 15 or many stamens, inferior ovary, and drupaceous fr. Allied to Ebenaceæ and Styracaceæ. There is only one genus, Symplocos.

SYMPLOCARPUS (*Spathyema*). *Araceæ.* One strong-smelling per. herb native in swamps and wet soil in E. N. Amer., and sometimes transplanted from the wild for the great lf.-clumps; spathes appearing before the lvs. and also ornamental but the odor disagreeable. S. fœtidus. SKUNK-CABBAGE. Lvs. to 3 ft. long and 1 ft. wide, entire, the petioles 1 ft. or more long.

SYMPLOCOS. SWEETLEAF. *Symplocaceæ.* Characters as for the family: of wide distribution, a few grown for ornament.

Only *S. paniculata* is hardy North. Propagated by seeds which are slow to germinate, by layers, and by cuttings of young wood under glass.

cratægoides: *S. paniculata.*

paniculata (*S. cratægoides*). To 40 ft., deciduous: lvs. obovate, to 3 in. long, finely toothed: fls. white, fragrant, ⅓ in. across, in panicles to 3 in. long: fr. blue. Himalayan region, China, Japan.

tinctoria. To 30 ft., partially evergreen: lvs. oval, to 6 in. long, scarcely toothed: fls. yellowish, fragrant, ⅖ in. across, in dense clusters: fr. orange or brown. Del. to Fla. and La.

SYNADENIUM. *Euphorbiaceæ.* African shrubs with thick fleshy branches, milky juice, alternate simple lvs., fls. in cyathia (see *Euphorbiaceæ*), and capsular frs.; sometimes planted for ornament in the tropics and warm regions. For cult. see *Succulents.*

Grantii. AFRICAN MILK-BUSH. To 12 ft.: lvs. narrow-obovate, to 4 in. long, fleshy: fls. red. Trop. Afr.

SYNCARPIA. *Myrtaceæ.* Australian evergreen trees with opposite simple lvs., white fls. in globose heads and capsular frs. inclosed in the calyx; grown in S. U. S. for a shade tree and the wood is used for building purposes.

glomulifera (*S. laurifolia*). TURPENTINE TREE. To 200 ft.: lvs. broadly ovate, to 3 in. long, very thick and tomentose beneath.

laurifolia: *S. glomulifera.*

SYNDESMON: *Anemonella.*

SYNECHANTHUS. *Palmaceæ.* Palms differing from Chamædorea in being monœcious in each spadix and the fls. not spirally arranged, spadices always among the lvs.; stamens either 3 or 6, and in technical characters of fls.: low unarmed gregarious feather-palms, 3 or 4 species in Cent. Amer. and Colombia; suitable for growing under glass, and also under lath or in protected woods in S. Fla. For cult. see *Palm.*

fibrosa. St. to 4 ft., strongly ringed: lvs. pinnate, to 4 ft. long, ascending and spreading; pinnæ 30–40, more or less pendulous, 1–1½ ft. long, pointed: fr. oblong, orange-red. Cent. Amer.

SYNTHERISMA (*Digitaria*). *Gramineæ.* Ann. grasses of wide range, having flat lvs. and spikelets in one-sided racemes borne in whorls or digitately at top of sts. See *Grasses.*

sanguinale (*D. ciliaris*). Sts. often decumbent, to 3 ft.: lvs. to 6 in. long and ⅓ in. wide: racemes to 6 in. long, very narrow, 3–10 together. Eu., but widely nat. —Weedy grass but sometimes planted for ornament.

SYNTHYRIS. *Scrophulariaceæ.* Per. herbs native in N. Amer. and Eu., with basal long-stalked lvs. and small oblong to wheel-shaped 4-lobed fls. in close racemes or spikes; sometimes grown in the border.

plantaginea (*Besseya plantaginea*). To 1 ft.: lvs. oblong, to 6 in. long, toothed, pubescent: fls. purple or pink. Wyo. to New Mex.

reniformis. To 9 in.: lvs. orbicular-reniform, to 2 in. across, deeply toothed, glabrous: fls. blue or purple, ¼ in. long. Wash. to Calif.

rotundifolia. To 5 in.: lvs. ovate-cordate, to 2 in. long, toothed, rough: fls. white, ⅙ in. long. Ore. to Calif.

SYRINGA. LILAC. *Oleaceæ.* European and Asian deciduous shrubs or small trees with opposite mostly simple lvs., small white, lilac or purple tubular fls. in showy panicles or thyrses in spring and early summer, often very fragrant, and fr. a leathery caps. As a vernacular name, Syringa is sometimes applied to the mock-orange or Philadelphus.

Lilacs are amongst the most popular ornamental shrubs and most of them are hardy North. They thrive in fertile rather moist soil, although growing readily on most lands. Transplanting is easily effected in fall or spring. Propagated by seeds stratified and sown in spring, by cuttings of green wood, ripe wood and roots, by layers and suckers, and varieties by grafting or budding on other lilacs or on privet.

Lilacs may also be forced for winter bloom under glass. Plants should be potted in early spring and plunged outdoors in summer, giving ample water. Three to five weeks are required to bring the plants into bloom, under a temperature from 60–80°. For white blossoms the plants must be forced in darkened rooms.

affinis: *S. oblata* var.

amurensis (*S. sibirica*). To 12 ft.: lvs. ovate, to 5 in. long, glabrous: fls. yellowish-white, in loose panicles to 6 in. long, with very short corolla-tube and exserted stamens. Manchuria, China.

chinensis (*S. rothomagensis*). Hybrid between *S. persica* and *S. vulgaris:* to 15 ft.: lvs. ovate-lanceolate, to 3 in. long, glabrous: fls. lilac or purple. Var. **alba** has white fls.; **duplex**, double purplish-lilac; **metensis**, rosy-lilac; Saugeana (var. *rubra*), lilac-red.

dilatata: *S. oblata* var.

emodi. Himalayan L. To 15 ft.: lvs. oval or oblong, to 8 in. long, glabrous, glaucous beneath: fls. lilac or whitish, in dense terminal panicles to 6 in. long, with corolla-tube ⅓ in. long. W. Asia; not hardy far N.

formosissima: *S. Wolfi.*

Giraldii: *S. oblata* var.

Henryi. Hybrid between *S. villosa* and *S. Josikæa:* lvs. pubescent on midrib beneath: fls. pale violet-purple, in panicles to 10 in. long.

hyacinthiflora. Hybrid between *S. oblata* and *S. vulgaris:* lvs. broad-ovate. Var. **plena** with double fls. is the form cult.

japonica (*S. amurensis* var. *japonica*). Tree to 30 ft.: lvs. broad-ovate to ovate-oblong, to 6 in. long, pubescent beneath: fls. yellowish-white, in panicles to 1 ft. long, with very short corolla-tube and exserted stamens. Japan.

Josikæa. Hungarian L. To 12 ft.: lvs. oval, to 5 in. long, shining above, glaucous and nearly glabrous beneath: fls. lilac, in terminal panicles to 7 in. long, with corolla-tube ½ in. long. Hungary.

Julianæ. To 6 ft.: lvs. ovate, to 2½ in. long, pubescent on both sides: fls. lilac, fragrant, in lateral panicles to 4 in. long, with corolla-tube ⅓ in. long. China.

Koehneana: *S. velutina.*

Komarowi. To 15 ft.: lvs. ovate-oblong to oblong-lanceolate, to 6 in. long, pubescent beneath: fls. lilac, in nodding terminal panicles to 6 in. long. China. Var. **Sargentiana** is more pubescent, with longer panicles.

Meyeri. Small shrub: lvs. oval, to 1½ in. long, pubescent on veins beneath: fls. purple-lilac, in dense lateral panicles to 3 in. long, with corolla-tube ½ in. long. China.

microphylla. Small shrub: lvs. ovate, to 1½ in. long, pubescent beneath: fls. lilac, in lateral panicles to 3 in. long, with corolla-tube ⅓ in. long. China.

oblata. To 12 ft.: lvs. ovate or reniform, cordate at base, to 4 in. long, glabrous: fls. lilac, in dense lateral panicles to 5 in. long, with corolla-tube ½ in. long. China. Var. **affinis** (*S affinis*) has smaller lvs. and white fls. Var. **dilatata** (*S. dilatata*) has long-acuminate lvs. Var. **Giraldii** (*S. Giraldii*) has lvs. often pubescent beneath and panicles 6 in. long.

Palibiniana. To 10 ft.: lvs. oval, to 3 in. long, pubescent on veins beneath: fls. pale lilac, in loose lateral panicles to 6 in. long, with corolla-tube ⅓ in. long. Korea.

pekinensis (*S. amurensis* var. *pekinensis*). To 15 ft.: lvs. ovate or ovate-lanceolate, to 4 in. long, glabrous: fls. yellowish-white, in panicles to 6 in. long, with short corolla-tube. China. Var. **pendula** has drooping branches.

persica. Persian L. To 6 ft.: lvs. lanceolate, to 2½ in. long, glabrous: fls. lilac or whitish, fragrant, in loose lateral panicles to 3 in. long, with corolla-tube ⅓ in. long. Persia to China. Var. **alba** has white fls. Var. **laciniata** has pinnately lobed or cut lvs.

pinnatifolia. To 10 ft.: lvs. of 7–11 ovate or ovate-lanceolate lfts. to 1 in. long: fls. white or pale lilac, in lateral panicles to 3 in. long, with corolla-tube ⅓ in. long. China.

Prestoniæ. Hybrids, *S. reflexa* × *S. villosa:* lvs. resembling those of *S. villosa:* fls. pale pink to pinkish-lilac. Very hardy. Produced in Canada.

pubescens. To 6 ft.: lvs. broad-ovate, to 3 in. long, pubescent beneath: fls. pale lilac, fragrant, in dense lateral panicles to 5 in. long, with corolla-tube ½ in. long. China.

reflexa. To 12 ft.: lvs. oblong, to 6 in. long, pubescent beneath: fls. pinkish, white inside, in terminal drooping panicles to 7 in. long, with corolla-tube ⅓ in. long. China.

rothomagensis: *S. chinensis.*

sibirica: *S. amurensis.*

Sweginzowii. To 10 ft.: lvs. oblong or ovate, to 4 in. long, pubescent on veins beneath: fls. lilac, fragrant, in terminal panicles to 8 in. long, with corolla-tube ⅓ in. long. China Var. **superba** is similar.

tomentella (*S. Wilsonii*). To 10 ft.: lvs. oval to oblong-lanceolate, to 4 in. long, pubescent beneath: fls. lilac or whitish, in loose terminal panicles to 7 in. long, with corolla-tube ⅓ in. long. China.

velutina (*S. Koehneana*). To 10 ft.: lvs. oval or ovate-oblong, to 4 in. long, pubescent both sides: fls. lilac, in terminal panicles to 5 in. long, with corolla-tube ⅓ in. long. China, Korea.

villosa. To 10 ft.: lvs. oval to oblong, to 7 in. long, pubescent on veins beneath: fls. lilac or pinkish-white, in terminal panicles to 1 ft. long, with corolla-tube ½ in. long. China.

vulgaris. Common L. To 20 ft.: lvs. ovate, to 5 in. long, glabrous: fls. lilac or white, fragrant, in lateral panicles to 10 in. long, with corolla-tube ⅓ in. long. S. E. Eu. Var. **alba** has white fls., **cærulea** blue, **plena**, double blue, **purpurea**, purplish-red, **violacea**, violet-lilac.

Wilsonii: *S. tomentella.*

Wolfi (*S. formosissima*). To 20 ft.: lvs. oval-oblong, to 6 in. long, pubescent on veins beneath: fls. lilac, fragrant, in terminal panicles to 1 ft. long, with corolla-tube ½ in. long. Manchuria, Korea.

yunnanensis. To 10 ft.: lvs. oval to oval-lanceolate, to 3 in. long, glaucous beneath: fls. pink, in terminal panicles to 6 in. long, with corolla-tube ¼ in. long. China.

SYZYGIUM: *Eugenia.*

T

TABEBUIA. *Bignoniaceæ.* Trop. American evergreen trees or shrubs with simple or digitately compound lvs., funnelform 5-lobed fls. in showy terminal racemes or panicles, and linear capsular frs.; 1 or 2 species sometimes grown in S. U. S. where they thrive in rich soil. Propagated by cuttings and air-layers, as well as by seeds.

argentea (*Tecoma argentea*). To 25 ft.: lvs. of 5–7 oblong lfts. to 6 in. long, densely silvery-scaly on both sides: fls. yellow, 2½ in. long: frs. gray lined with black, to 4 in. long. Paraguay.

pallida (*T. pentaphylla*). To 50 ft. or more, somewhat scaly: lfts. mostly 3–5, elliptic to narrow-obovate, to 6 in. long, entire: fls. white with colored veins, or pink or rose, nearly 3 in. long, with or preceding the lvs. W. Indies, Cent. and N. S. Amer.—Sometimes called "white-cedar"; planted in S. Fla.

pentaphylla: *T. pallida.*

serratifolia (*Bignonia* and *Tecoma serratifolia*). Tree to 30 ft. or more: lvs. of 4–5 oblong-ovate lfts. to 5 in. long, toothed at tips: fls. yellow, 2½ in. long. W. Indies.

TABERNÆMONTANA. *Apocynaceæ.* Trop. trees and shrubs planted for ornament in warm regions as shrubbery: lvs. opposite: fls. salver-shaped, in terminal cymes, white or yellow: fr. of 2 follicles or berries. Propagated by cuttings.

citrifolia. To 6 ft.: lvs. oblong, to 5 in. long: fls. white, to 1 in. across, fragrant. W. Indies, Mex.

coronaria: *Ervatamia coronaria.*

grandiflora. To 6 ft.: lvs. oblong-ovate, to 5 in. long: fls. yellow, 1½ in. across, fragrant. Venezuela, Guiana.

grandifolia: apparently a form of *Ervatamia coronaria.*

TABOG: *Swinglea.*

TACAMAHAC: *Populus Tacamahacca.*

TACCA. *Taccaceæ.* Trop. per. herbs with large basal lvs. and brown or greenish fls. in dense umbels terminating the scape, subtended by leaf-like or colored bracts, bearing conspicuous long thread-like sterile pedicels mixed with the fls.

Taccas are suitable for greenhouse cultivation. They require rich open well-drained soil and should be rested in winter. Propagated by division of the roots.

Chantrieri. Lvs. oval, 1½ ft. long and 10 in. wide, shining, the petioles reddish-brown and 2½ ft. long: fls. brownish-purple, 1¾ in. across. Malaya.

cristata. Lvs. oblong, to 2 ft. long and 6 in. wide, dark purplish-green, shining above: fls. brownish-purple, 1½ in. across. Malaya.

pinnatifida. Tubers 1 in. through, often grown in the tropics for arrowroot: lvs. to 4 ft. across, 3-parted and the segms. pinnatifid: fls. greenish and purplish, ¾ in. across. Trop. Asia, Afr., Australia.

TACCACEÆ. TACCA FAMILY. Two trop. monocotyledonous herbaceous genera, mostly of the eastern hemisphere, with characters of Tacca which see. Allied to Dioscoreaceæ.

TACSONIA: *Passiflora.*

TÆNIDIA. *Umbelliferæ.* One per. herb native from Que. to Miss., sometimes transferred from the wild. **T. integerrima.** To 3 ft.: lvs. 2–3-ternately compound into ovate to lanceolate entire segms. to 1 in. long: fls. yellow, in compound umbels: frs. oval, ⅙ in. long.

TAGETES. MARIGOLD. *Compositæ.* Mostly ann. strong-scented herbs with usually opposite lvs. finely dissected, and solitary or clustered heads of yellow, orange or red ray- and disk-fls.; pappus of scales or bristles; native from New Mex. to Argentina.

Marigolds are popular as cut-flowers and are of simple cultivation. Propagated by seeds sown where plants are to stand or started early in the house.

erecta. BIG or AZTEC M. AFRICAN M. (once supposed to be native in Afr.). Stout ann., erect, to 3 ft.: lvs. pinnate: heads solitary, to 4 in. across, yellow to orange, the rays numerous and long-clawed, sometimes 2-lipped or quilled. Mex.

lucida. SWEET-SCENTED M. Per., cult. as ann., to 1½ ft.: lvs. simple, oblong-lanceolate, finely toothed but not divided: heads ½ in. across, 2–3-rayed, golden or orange-yellow, in dense terminal clusters. Mex.—Not common in cult.

patula. FRENCH M. Ann., much branched from base, to 1½ ft.: lvs. pinnate: heads solitary, to 1½ in. across, rays numerous, yellow with red markings. Mex.

signata: *T. tenuifolia.*

tenuifolia (*T. signata*). Ann. to 2 ft.: lvs. finely cut: heads solitary, about 1 in. across, rays few, yellow. Mex. Var. **pumila** is dwarf, 1 ft. or less high.

TAINIA: *Ascotainia viridifusca.*

TAIWANIA. *Pinaceæ.* One tall evergreen tree from Formosa (Taiwan) and W. China, allied to Cryptomeria, suitable for cult. in Calif. and Fla. **T. cryptomerioides.** Young lvs. linear, ½ in. long, adult lvs. scale-like, imbricated, to ⅕ in. long: cones ½ in. long, with leathery scales.—It is a new plant to cult., the genus having been founded by Hayata as late as 1906. For cult. see *Conifers.*

TALINUM. FAME-FLOWER. *Portulacaceæ.* Per. more or less fleshy small herbs sometimes woody at base, with alternate or nearly opposite lvs., small ephemeral fls. mostly in erect terminal cymes or panicles, and capsular frs. Useful in borders and rock-gardens, and sometimes as tub plants for the foliage. Native in both hemispheres.

calycinum. To 8 in.: lvs. to 2 in. long: fls. pink, 1 in. or more across. Ark. to Mex.

paniculatum. To 2 ft. or more: lvs. elliptic or obovate, to 3 in. long: fls. red to yellowish, in a panicle to 10 in. long. S. U. S. and south.—A form with white-edged lvs. is a tub or pot-plant.

parviflorum. To 8 in.: lvs. to 2 in. long: fls. pink, about ⅓ in. across. Minn. to Tex.

triangulare. Stout and fleshy, to 1½ or 2 ft: lvs. obovate or narrower, about 3 in. long: fls. red to whitish or yellowish, in racemes. Trop. Amer., and widely spread as an ornamental and pot-herb.

TALLOW-TREE, CHINESE: *Sapium sebiferum.*

TALLOW, VEGETABLE: *Sapium sebiferum.*

TAMALA: *Persea.*

TAMARACK: *Larix laricina.*

TAMARICACEÆ. TAMARISK FAMILY. Four genera of shrubs or trees from the Medit. region to Japan, having alternate mostly small and scale-like lvs., regular bisexual fls. with 4–5 sepals and petals, 8–10 stamens, superior 1-celled ovary and capsular fr. Myricaria and Tamarix are planted for ornament.

TAMARIND: *Tamarindus.* Manila: *Pithecellobium dulce.*

TAMARINDUS. *Leguminosæ.* One evergreen tree widely grown in the tropics for ornament and for the frs. which are eaten in various forms, made into drinks, and also have medicinal properties. Tamarinds thrive on deep soil with abundant rainfall or irrigation. Propagated by seeds and by shield-budding. **T. indica.** TAMARIND. TAMARINDO. To 80 ft., making a massive picturesque tree: lvs. pinnate, the lfts. to ¾ in. long: fls. pale yellow, 1 in. across, in few-fld. racemes: pods to 8 in. long, cinnamon-brown. Probably trop. Afr. and S. Asia.

TAMARISK: *Tamarix.* False: *Myricaria.*

TAMARIX. TAMARISK. *Tamaricaceæ.* Small deciduous or evergrowing trees or shrubs, Eu. and Asia, the graceful slender branches bearing small heath-like lvs. and pink or white fls. with the parts in 5's or in 4's, in prominent racemes or panicles.

Tamarisks are grown for ornament, as windbreaks and along the coast as they withstand salt spray. Propagated by seeds, hardwood cuttings, or greenwood cuttings under glass.

africana. To 10 ft.: fls. pinkish, nearly sessile, in racemes to 3 in. long which are lateral on last year's branches, in spring. Medit. region; hardy only far S.—The plant cult. under this name is usually *T. parviflora.*

algerica: probably *T. gallica.*

amurensis: *T. pentandra.*

anglica. To 10 ft.: fls. white or pinkish, in terminal panicles in early summer, petals falling from the frs. W. Eu.; for central or southern states.

articulata. To 30 ft., with jointed branchlets and minute sheathing lvs. like a Casuarina: fls. pink, sessile, in terminal panicles. W. Asia.—Intro. as windbreak in desert regions of S. Calif.; the naked green twigs make it "evergreen."

chinensis. To 15 ft., with fine often drooping spray: fls. pink, in loose terminal panicles in summer, petals persistent on frs. China; only far S.

gallica. To 30 ft.: fls. white or pinkish, in panicled racemes in early summer, petals deciduous from the frs. W. Eu. to Himalayas; probably hardy in central states. Var. **indica** has longer and slenderer racemes.

hispida. To 4 ft., branchlets and lvs. pubescent: fls. pink, in dense panicled racemes in late summer. Caspian region; hardy in central or southern states. Var. *æstivalis* is *T. pentandra.*

indica: *T. gallica* var.

japonica: *T. juniperina.*

juniperina (*T. japonica. T. plumosa*). To 15 ft.: fls. pinkish, in lateral racemes in spring, petals remaining on fr. China, Japan; probably not hardy N.

odessana. To 6 ft.: fls. pink, in slender panicled racemes in summer, petals persistent on frs. Caspian region; hardy in New England.

parviflora. To 15 ft.: fls. pink, in short lateral racemes in spring, parts of the fl. in 4's, the petals persistent on frs. S. Eu.; hardy in S. New England. Var. **purpurea** is a hort. form.

pentandra (*T. hispida æstivalis. T. amurensis*). To 15 ft.: fls. pink, in dense racemes forming large panicles, in late summer, petals persistent on frs. Eu., Asia; hardy in S. New England.

plumosa: *T. juniperina.*

tetrandra. To 12 ft.: fls. pale pink or white, in lateral racemes in spring, petals deciduous from fr. Eu., Asia.

TAMUS (*Tamnus*). *Dioscoreaceæ.* Two twining tuberous-rooted diœcious perennials, one sometimes planted for ornament, with the look of Dioscorea but differing in bearing a few-seeded berry. **T. communis,** BLACK BRYONY, of Great Britain and distributed on the Continent, has slender angular sts. many ft. long, long-petioled and more or less obscurely lobed pointed lvs. and fls. mostly in axillary racemes or fascicles: berry small, red.

TANACETUM. TANSY. *Compositæ.* Ann. and per. strong-scented herbs with alternate pinnately cut lvs. and small yellow clustered heads of disk-fls.; pappus none or a crown; native in northern hemisphere.

Tansy is grown in the garden for ornament and medicinal purposes. It thrives in all common situations and in soils not too wet. Propagated usually by dividing the old clumps; also by seed.

Balsamita: *Chrysanthemum Balsamita.*

huronense. HURON T. Per. to 3 ft., pubescent: lvs. 2-pinnate: heads to ¾ in. across, usually few. Alaska to Ore. and Me.

macrophyllum: *Chrysanthemum macrophyllum.*

vulgare (*Chrysanthemum vulgare*). COMMON T. Per. to 3 ft., nearly glabrous: lvs. pinnate: heads to ½ in. across, yellow, numerous, in flat-topped cymes. Eu.; escaped in U. S. Var. **crispum** has finer more crisped foliage.

TANGERINE: see *Citrus nobilis* var.

TANIER: *Xanthosoma.*

TANSY: *Tanacetum.*

TANYOSHO: *Pinus densiflora* var. *umbraculifera.*

TAPE-GRASS: *Vallisneria.*

TAPIOCA-PLANT: *Manihot esculenta.*

TARAJO: *Ilex latifolia.*

TARAKTOGENOS. *Flacourtiaceæ.* Malayan trees one of which yields chaulmoogra oil: lvs. alternate, entire: fls. bisexual or unisexual, in axillary few-fld. cymes, the stamens numerous: frs. globular or ovoid, hard. One species has been intro. into S. Calif. and Fla.

Kurzii. To 50 ft.: lvs. lanceolate, to 10 in. long, shining: staminate fls. 3 in. across, with 4 sepals and 8 petals: fr. brownish-yellow, tomentose, size of orange. Burma.

TARATA: *Pittosporum eugenioides.*

TARA-VINE: *Actinidia arguta.*

TARAXACUM. DANDELION. *Compositæ.* Per. stemless herbs with irregularly cut lvs. in a basal rosette and heads terminating hollow sts., of yellow ligulate fls.; pappus of bristles; mostly of the northern hemisphere. See *Dandelion.*

Dens-leonis: *T. officinale.*

officinale (*T. Dens-leonis. Leontodon Taraxacum*). COMMON D. Lvs. to 10 in. long, pinnately cut or toothed: heads golden-yellow, 2 in. across. Eu., a weed in most parts of the world.

TARE: *Vicia sativa.*

TAR-FLOWER: *Befaria racemosa.*

TARO: *Colocasia esculenta.*

TARRAGON: *Artemisia Dracunculus.*

TARTOGO: *Jatropha podagrica.*

TARWEED: *Madia.*

TASSEL-FLOWER: *Amaranthus caudatus, Brickellia grandiflora, Emilia sagittata.*

TAWHIWHI: *Pittosporum tenuifolium.*

TAXACEÆ. YEW FAMILY. Eleven genera of widely distributed evergreen trees and shrubs with needle- or scale-like lvs.: fls. usually diœcious, the staminate cone-like, the pistillate of 1 or 2 ovaries: fr. berry-like, consisting of a seed with a bony shell surrounded by a fleshy aril. The family was established in 1836 by Lindley, but until recent years has been customarily included in the Coniferæ, with the pine and ginkgo families. Ornamental genera are Cephalotaxus, Dacrydium, Phyllocladus, Podocarpus, Saxegothæa, Taxus, Torreya. In respect to foliage characters these genera fall into the yew-like kinds (Taxus, Cephalotaxus, Torreya, Saxegothæa), those with lvs. ¼–1 in. broad as in many of the Podocarpuses, those with lycopodium-like little lvs. on mature parts as Dacrydium, and those with flat toothed phyllodia. For the distinctions, see *Conifers.*

TAXODIUM. *Pinaceæ.* Trees with linear deciduous or evergreen lvs., staminate fls. in catkins, and globose cones with woody scales; 3 species in E. N. Amer. and Mex. For cult. see *Conifers.*

ascendens (*T. distichum* var. *imbricarium*). POND CYPRESS. Lvs. deciduous, awl-shaped, about ½ in. long, appressed: cones 1 in. across. Va. to Fla. and Ala. Var. **nutans** (var. *pendulum*) has drooping branchlets.

distichum. BALD CYPRESS. Lvs. deciduous, linear, to ¾ in. long, spreading, light green: cones 1 in. across. Del. to Fla. and La.; hardy in northern states but remains small. Var. **fastigiatum**, slender erect form; var. **nanum**, dwarf and shrubby; var. **pyramidalis**, narrow pyramidal form.—It is not certain whether these hort. forms belong here or with *T. ascendens.*

mucronatum. MONTEZUMA CYPRESS. Differs from *T. distichum* in the evergreen shorter lvs. and larger cones. Mex.; planted in Calif.; said to become deciduous when planted too far N.

TAXUS. YEW. *Taxaceæ.* Evergreen trees and shrubs with linear dark green lvs. paler or yellowish beneath, inconspicuous diœcious fls., and seeds in berry-like red cups.; native in the northern hemisphere. See *Conifers* for cult.

baccata. ENGLISH Y. Tree to 60 ft.: lvs. to 1¼ in. long, gradually acuminate, pale beneath: fr. brown, in Sept.–Oct. Eu., N. Afr., W. Asia; hardy in N. Y. and parts of New England, but some of the vars. stand better than the species itself in the colder climates. There are numerous named forms, such as the following vars.: **adpressa** (*T. brevifolia, T. tardiva*), shrub or low tree with lvs. to ½ in. long and its forms **aurea** with yellow lvs. and **stricta** and **erecta** of columnar habit; **aurea**, lvs. yellow; **chestuntensis**, branches ascending, lvs. bluish-green below; **Dovastonii** (*T. pendula*), branchlets pendulous, and its form **aureo-variegata** with lvs. variegated yellow; **elegantissima**, compact form with young lvs. striped pale yellow; **epacrioides**, rather dwarf with light green lvs.; **erecta** (var. *stricta*), upright bushy var. and its forms **aurea** and **Crowderi**; **ericoides** (*T. Michelii, T. microphylla*), dwarf, with very narrow lvs.; **expansa**, low bush with pendulous branches; **fastigiata** (*T. hibernica*), IRISH Y., columnar with very dark green lvs., and its forms **aurea** and **variegata**; **glauca**, lvs. bluish-green below; **horizontalis**, branches spreading horizontally; **imperialis**, perhaps synonymous with *T. baccata:* **Jacksonii**, spreading branches pendulous at tips; **lutea** (var. *luteo-baccata*), fr. yellow; **nana**, of dwarf dense habit; **procumbens**, prostrate much branched shrub; **pyramidalis**, of pyramidal habit; **recurvata**, spreading recurved branches; **repandens**, nearly prostrate with bluish-green lvs.; **semperaurea**, low habit, lvs. keeping yellow color the second year; **variegata** (var. *argentea*), lvs. variegated with white or whitish; **Washingtoni**, wide-spreading with golden-yellow lvs. Other listed names are *Baronii femina, Livingstonii, major, polycarpa.*

brevifolia (*T. Lindleyana*). WESTERN Y. Tree to 45 ft. or more: lvs. 1 in. or less long, abruptly pointed, dark yellowish-green: fr. Aug.–Sept. Mont. to B. C. and Calif.—The material commonly cult. under this name is *T. baccata* var. *adpressa* or *T. cuspidata* var. *nana.*

canadensis. GROUND-HEMLOCK. Straggling shrub sometimes 6 ft. high: lvs. 1 in. long, abruptly pointed, dark yellowish-green above: fr. in Aug. E. N. Amer., as far north as Newf. Var. **stricta** is dwarf.

chinensis. CHINESE Y. Tree to 50 ft.: lvs. to 1¾ in. long, abruptly pointed, grayish-green below: fr. Sept.–Oct. China; hardy N.

cuspidata (*T. Sieboldii*). JAPANESE Y. Tree to 50 ft.: lvs. to 1 in. long, abruptly pointed, with 2 yellow bands below: fr. Oct.–Nov. Japan, Korea, Manchuria; hardy N. and popular. Hort. forms are: **aurescens**, low form with young lvs. deep yellow, requiring sheltered place; **capitata**, synonymous with *T. cuspidata:* **densa**, low dense bush; **nana** (var. *brevifolia*, var. *compacta*), shrubby form.

hibernica: *T. baccata* var. *fastigiata.*

Hunnewelliana. Hybrid between *T. cuspidata* and *T. baccata.*

Lindleyana: *T. brevifolia.*

media. Hybrid between *T. cuspidata* and *T. baccata.* Vars. are **Hatfieldii** of bush form, and **Hicksii** of columnar habit.

Michelii: *T. baccata* var. *ericoides.*

microphylla: *T. baccata* var. *ericoides.*

pendula: *T. baccata* var. *Dovastonii.*

Sieboldii: *T. cuspidata.*

tardiva: *T. baccata* var. *adpressa.*

TEA: *Thea.* **Crystal-**: *Ledum palustre.* **Jersey-**: *Ceanothus americanus.* **Labrador-**: *Ledum grœnlandicum.* **Mexican-**: *Ephedra, Chenopodium ambrosioides.* **Oswego-**: *Monarda didyma.* **Philippine-**: *Ehretia microphylla.* **-Tree, Australian**: *Leptospermum lævigatum.*

TEABERRY: *Gaultheria procumbens.*

TEAK: *Tectona grandis.*

TEASEL: *Dipsacus.*

TECOMA. *Bignoniaceæ.* Shrubs with mostly pinnate lvs. of toothed lfts., fragrant yellowish funnelform fls. in terminal racemes or panicles, and linear leathery capsular frs.; native from S. U. S. to Argentina.

Tecomas are grown in southern United States and will stand only a few degrees of frost. Propagated by seeds and by cuttings of green wood under glass.

argentea: *Tabebuia argentea.*

australis: *Pandorea pandorana.*

capensis: *Tecomaria capensis.*

Garrocha. Shrub to 5 ft. or more: lvs. of 7–11 oblong-ovate acuminate lfts. to 2 in. long, glabrous: fls. yellow or salmon with scarlet tube, 2 in. long and 1 in. across, gradually narrowed to base: fr. to 4 in. long. Argentina.

grandiflora: *Campsis chinensis.*

jasminoides: *Pandorea jasminoides.*

Mackenii: *Pandorea Ricasoliana.*

mollis: *Stenolobium stans* var. *velutina.*

Princei: *Campsis hybrida.*

radicans: *Campsis radicans.*

Reginæ-Sabæ: *Pandorea Brycei.*

Ricasoliana: *Pandorea Ricasoliana.*

sambucifolia: the plant cult. under this name is *Stenolobium stans* var. *angustata*.

serratifolia: *Tabebuia serratifolia*.

Smithii. Erect shrub: supposed hybrid between *Stenolobium stans* var. *velutina* and *Tecomaria capensis*: lvs. of 11–17 oblong or acutish lfts. to 2 in. long: fls. yellow tinged orange, to 2 in. long, gradually narrowed toward base. Raised in Australia.

stans: *Stenolobium stans*.

Tweediana: *Doxantha Unguis-cati*.

velutina: *Stenolobium stans* var.

TECOMARIA. *Bignoniaceæ*. A few evergreen shrubs in Amer. and S. Afr., partially climbing, with pinnate lvs., funnelform curved yellow to scarlet fls. in dense terminal racemes or panicles, the stamens exserted, and linear flattened frs.; one species is grown in the S. as a hedge and division plant and sometimes under glass. Propagated by seeds and cuttings under glass.

capensis (*Tecoma capensis*). CAPE-HONEYSUCKLE. Lvs. of 7–9 ovate toothed lfts. to 2 in. long: fls. orange-red or scarlet, 2 in. long: fr. to 2 in. long. S. Afr.

TECTONA. *Verbenaceæ*. Trees, one of which furnishes the teak-wood of commerce, with large opposite or whorled simple lvs. and small white or bluish fls. in terminal panicles.

grandis. TEAK. To 150 ft.: lvs. ovate, to 1 ft. and more long, tomentose beneath: fr. globular, 1 in. across. India, Malaya.—Sometimes planted far S. and in the tropics for ornament and interest.

TEFF: *Eragrostis abyssinica*.

TELANTHERA: *Alternanthera*.

TELEGRAPH-PLANT: *Desmodium gyrans*.

TELEKIA: *Buphthalmum*.

TELEPHIUM. ORPINE. *Caryophyllaceæ*. Much branched herbs from the Medit. region, with alternate lvs. and white fls. in terminal clusters; rarely cult. in the rock-garden.

Imperati. Per., with prostrate leafy sts. to 1 ft. long: lvs. oblong, thick, to ½ in. long: fls. July–Aug. Eu.

TELLIMA. *Saxifragaceæ*. Hairy per. herbs from W. N. Amer. similar to Mitella but differing in the 2-beaked caps.; suitable for the wild-garden.

affinis: *Lithofragma affinis*.

grandiflora. To 2 ft.: lvs. cordate-ovate, lobed, to 4 in. across: fls. greenish turning pink or red, the petals pinnately cut. Alaska to Calif.

TELOPEA. *Proteaceæ*. Australian shrubs with alternate leathery lvs., red fls. in dense terminal head-like racemes surrounded by an involucre of colored bracts, and fr. a leathery follicle; intro. in Calif.

speciosissima. WARATAH. To 8 ft.: lvs. oblong, to 10 in. long, toothed in upper part: fls. 1 in. long, in globular heads to 3 in. across, bracts to 3 in. long.

TEMPLETONIA. *Leguminosæ*. Australian shrubs with simple lvs., papilionaceous fls. solitary or few in the axils, and flattened pods; grown under glass or out-of-doors in the S. Propagated by cuttings.

retusa. CORAL-BUSH. Lvs. leathery, 1 in. or less long, notched or mucronate at tip: fls. red, to 1½ in. long: pod to 2 in. long.

TENDRIL: a rotating or twisting thread-like process or extension by which a plant grasps an object and clings to it for support; morphologically it may be stem or leaf or extension of inflorescence.

TEOSINTE: *Euchlæna*.

TEPHROSIA (*Cracca*). *Leguminosæ*. Herbs or shrubs with pinnate lvs., red, purple or white papilionaceous fls. in racemes, and flat pods; the first species is grown as a low windbreak in the tropics.

candida. Shrub to 10 ft.: lfts. 2 in. long, silky-pubescent beneath: fls. white, 1 in. long: pods to 4 in. long. India; nat. in W. Indies.

virginiana. Per. to 2 ft.: lfts. to 1 in. long, silky-pubescent: fls. yellowish-purple, to ¾ in. long: pods to 2 in. long. Me. to Fla. and N. Mex.

TERETE: circular in transverse section; imperfectly cylindrical because the object may taper both ways.

TERMINALIA. *Combretaceæ*. Trop. large trees, mostly in Asia, with simple lvs. usually crowded toward ends of branchlets, small bisexual or polygamo-diœcious fls. in spikes or racemes, and fr. an angled or winged 1-seeded drupe or drupe-like; planted for ornament in trop. climates and for the edible fr.; bark sometimes yields dyes and tannin. Propagated by seed.

Arjuna. To 80 ft.: lvs. oblong, to 6 in. long: fls. green or white, in short spikes or panicles: fr. dark brown, 5-winged, to 2 in. long. India.—Planted in S. Fla. for interest.

australis. Small glabrous tree to 10 ft.: lvs. lance-ovate to ovate, to 2 in. or more long, entire, pointed, petioles very short: fls. few and small, in peduncled axillary slender spikes that about equal the lvs., greenish. S. Brazil.—Probably planted in our territory.

Catappa. TROPICAL- or INDIAN-ALMOND. MYROBALAN. To 80 ft., deciduous, with horizontal branches: lvs. obovate, to 1 ft. long, becoming rich red before they fall twice a year: fls. greenish-white, the spikes to 6 in. long: fr. greenish or reddish, flattened, the 2 angles winged, to 2 in. long, with edible oil-bearing seed. Malaya.—Widely planted in trop. countries, and in S. Fla. as a street tree.

myriocarpa. To 100 ft., the young parts rusty-tomentose: lvs. oblong, tapering-acute, to 8 in. long, short-stalked, the many parallel veins at first rusty, margins serrate: fls. pink to white, changeable, in panicles: fr. about ⅛ in. long, with broader wings, yellow. India, Burma.

tomentosa. To 100 ft.: lvs. nearly opposite, elliptic, to 8 in. long, variable, mostly thin-tomentose underneath: fls. in spikes: fr. to 2 in. long, with 5 broad wings. India.

TERNATE: in threes.

TERNSTRŒMIA. *Theaceæ*. Warm-temp. and trop. evergreen trees and shrubs of Asia, Indian Archipelago and Amer., with alternate simple lvs., solitary or clustered fls. and indehiscent berry-like frs.; grown under glass or in the open in S. U. S.

japonica. Tree to 20 ft.: lvs. oblong, to 3 in. long, entire: fls. pale yellow, ¾ in. across: fr. to ¾ in. across. Japan to India.

TERNSTRŒMIACEÆ: *Theaceæ*.

TESSARANTHIUM: *Frasera speciosa*.

TESTUDINARIA. *Dioscoreaceæ*. Per. twining vines with tuberous rootstocks above ground, alternate lvs., small diœcious fls. borne in axillary racemes, and capsular frs.; grown as a curiosity in cool greenhouse.

elephantipes. Hottentots-Bread. Elephants-Foot. Sts. to 10 ft.: root to 3 ft. diam., half above ground, eaten by natives when cooked: lvs. orbicular: fls. greenish-yellow or whitish. S. Afr.

TETRACENTON. *Magnoliaceæ.* One deciduous Chinese tree, hardy N. **T. sinense.** To 100 ft.: lvs. alternate, ovate, to 5 in. long, toothed: fls. very small, yellowish, in drooping racemes to 6 in. long: fr. brown, ⅙ in. long.

TETRACLINIS. *Pinaceæ.* One evergreen tree to 20 ft. tall, native in N. Afr. **T. articulata** (*Callitris quadrivalvis*). Arar-Tree. Lvs. scale-like, minute: cones 4-sided, ½ in. across, of 4 scales.—Adapted only to the warmer parts of the country; by some authorities it is retained in the genus Callitris. For cult. see *Conifers.*

TETRAGONIA. *Aizoaceæ.* Herbs or subshrubs, one grown as a pot-herb, having alternate lvs. and small fls. without petals solitary or few in the axils.

New Zealand spinach is grown for use during the summer when the common spinach cannot be obtained. Seed should be scalded and soaked a few hours and then planted in hills about 3 feet apart. In the North plants may be started in the hotbed in early February and transplanted into pots until time to set out permanently.

crystallina. Glaucous herb: lvs. ovate, sessile: fr. without horns and with 4 seeds. Peru.

expansa. New Zealand Spinach. Prostrate somewhat succulent ann.: lvs. ovate or triangular-ovate, to 5 in. long, petioled: fls. yellowish-green: fr. with 4 horns and 6–8 seeds. Japan, Australia, New Zeal., S. Amer.

TETRAGONOLOBUS: *Lotus.*

TETRAMICRA: *Leptotes bicolor.*

TETRANEMA: *Allophyton mexicanum.*

TETRAPANAX. *Araliaceæ.* One shrub or small tree native in Formosa, grown out-of-doors in warm regions, and in the Orient used for the making of rice-paper. **T. papyriferum** (*Aralia papyrifera. Fatsia papyrifera*). Lvs. ovate, to 1 ft. across, with 5–7 toothed lobes to about middle, heart-shaped at base, densely white-tomentose beneath: fls. in round umbels forming a panicle, tomentose. For propagation see *Fatsia.*

TETRAPATHÆA. *Passifloraceæ.* One woody climber native in New Zeal. **T. tetrandra** (*Passiflora tetrandra*). Lvs. alternate, oblong- or ovate-lanceolate, entire, shining: fls. unisexual, greenish with a crown of yellowish filaments, in axillary cymes or solitary: fr. orange, to 1½ in. across.

TETRATHECA. *Tremandraceæ.* Australian heath-like shrubs with fls. solitary in the axils and capsular frs.; sepals and petals 4; grown under glass or in the open in warm regions. A soil of fibrous peat and silver sand is desirable.

ericifolia. To 1 ft.: lvs. mostly whorled, linear: fls. pink, to ⅓ in. long. New S. Wales.

TEUCRIUM. Germander. *Labiatæ.* Herbs, subshrubs or shrubs, some kinds grown in the greenhouse or in the open in the extreme S., others adapted to the rock- or wild-garden in the N.: fls. rather showy, in 2–many-fld. whorls in raceme-like spikes or heads. Grown from seed and by division of the plants or the slender rhizomes.

argenteum: hort. name for *T. fruticans.*

canadense. American G. Per. to 3 ft.: lvs. ovate-lanceolate to lanceolate, to 5 in. long, toothed, pubescent beneath: fls. purple to cream-color, ¾ in. long, in spikes 6 in. or more long. N. Amer.

Chamædrys (*T. pseudo-Chamædrys*). Procumbent shrub, the sts. ascending to 1 ft.: lvs. ovate, ¾ in. long, toothed, pubescent: fls. red-purple or bright rose with red and white spots, ¾ in. long, in few-fld. whorls in loose spikes. Eu.—Sometimes appearing incorrectly in the trade as *T. canadense.*

flavum. Per. to 2 ft., woody at base: lvs. ovate, thick, pubescent, pale beneath: fls. yellow, in long spikes. Medit. region.

fruticans. Shrub to 3 ft., white- or yellowish-woolly: lvs. ovate, to 1¼ in. long, entire and revolute: fls. blue, ¾ in. long, in terminal racemes. Eu.

Marum. Small much branched shrub, white-tomentose: lvs. ovate, ⅓ in. long, entire: fls. purplish, ½ in. long, in racemes to 2 in. long. Medit. region.

massiliense. Per. to 1 ft., gray-pubescent: lvs. ovate, about ½ in. long, wavy-toothed: fls. rose. S. Eu.

montanum. Prostrate subshrub, the sts. ascending to 1 ft.: lvs. oblong to linear-lanceolate, to ¾ in. long, entire and revolute, tomentose beneath: fls. white becoming yellow, ½ in. long, in hemispherical terminal heads. S. Eu., Orient.

orientale. Per. to 1 ft.: lvs. to 2 in. long, pinnately divided into linear entire or cut segms.: fls. violet or blue. W. Asia.

pseudo-Chamædrys: *T. Chamædrys.*

Scorodonia. Per. to 2 ft., pubescent: lvs. ovate, to 2½ in. long, toothed: fls. yellow, ⅓ in. long, in racemes to 5 in. long. Eu.; escaped in E. N. Amer.

THALIA. *Marantaceæ.* Tall aquatic or marsh herbs with basal long-petioled lvs. and fls. borne in bracts on spikes or panicles.

Plants should be grown in wet soil or shallow water. Propagated by division of the root.

dealbata. Plant covered with white powder: scape to 10 ft. or more: lvs. to 20 in. long and 10 in. wide: fls. dull violet, small. S. C. to Fla. and Tex.—Sometimes grown about ponds.

divaricata. Scape to 10 ft.: lvs. to 2 ft. long and 8 in. wide: fls. violet. Fla.

THALICTRUM. Meadow-Rue. *Ranunculaceæ.* Per. herbs, mostly tall, with ternately compound or decompound lvs. and small unisexual or bisexual fls. borne in panicles or racemes, without petals and with numerous stamens; native mostly in the north temp. zone.

Thalictrums are of easy culture in well-drained loamy soil. Propagated by division of roots in early spring, and also by seeds. In most species the flowers are not striking except for the hanging stamens, but the large open panicles make an attractive mass effect. In some species, as *T. dipterocarpum,* the sepals are large and showy, and in others, as *T. aquilegifolium,* the stamens are enlarged; many of them display good violet and purple shades. The native American species are excellent in the wild-garden; the big ones frequent low ground.

adiantifolium: this name many apply either to *T. minus* or *T. majus.*

alpinum. To 1 ft.: lvs. basal, biternate, the segms. obovate or orbicular, 3–5-lobed at tips, margins revolute: fls. with yellow stamens about length of greenish sepals: fr. sessile. Arctic Amer., Eu., Asia.

anemonoides: *Anemonella thalictroides.*

aquilegifolium. To 3 ft., mostly diœcious: lvs. decompound, the segms. orbicular or oblong with few broad teeth at apex: staminate fls. with erect purple or pink stamens much longer than white sepals: frs. 3-winged, stalked and hanging. Eu., Asia. Color forms are **album, atropurpureum, aurantiacum.**

baicalense. To 1½ ft.: lvs. decompound, the segms. nearly orbicular, toothed at apex: fls. few, erect, with long stamens: fr. striate, flattened, very short-stalked. Siberia.

Chelidonii. Dwarf, much branched: segms. orbicular, more or less cordate, glaucous underneath: fls. large and showy, lilac or purple. Himalayas; not hardy N.

Cornuti: *T. polygamum.*

corynellum: *T. polygamum.*

dasycarpum. To 7 ft., diœcious or polygamous: lvs. decompound, the segms. oblong or obovate, 3-lobed at tips: fls. with stamens longer than purplish sepals: fr. 3–8-winged, short-stalked. N. J. to Sask. and Ariz.

Delavayi. To 3 ft., diœcious: lvs. decompound, the segms. 3–5-lobed, long-stalked: staminate fls. with purple or lilac sepals about length of stamens: frs. 3-winged, stalked. E. China.

dioicum. To 2 ft., diœcious: lvs. decompound, the segms. orbicular, 5–9-lobed: staminate fls. with stamens much longer than greenish sepals: frs. strongly ribbed, sessile. Me. to Mo.

dipterocarpum. To 2 ft. or more: lvs. decompound, the segms. nearly orbicular, notched toward top, glaucous beneath: panicles narrow-pyramidal; fls. nodding, polygamous, with rose or lilac sepals about length of stamens: frs. 2-winged, unequal-sided, short-stalked. W. China.

Fendleri. To 3 ft., diœcious: lvs. decompound, the segms. roundish, toothed or lobed: staminate fls. with whitish sepals shorter than the stamens: frs. 3-ribbed, obliquely obovate, sessile. Colo. to Calif.

flavum. To 4 ft.: lvs. decompound, the segms. obovate and 3-lobed: fls. bisexual, the pale yellow sepals shorter than the bright yellow stamens: frs. 8-ribbed, sessile. Eu.

fœtidum. To 3 ft., glandular-pubescent, strong-smelling: lvs. decompound, the segms. roundish, small, notched at apex: fls. nodding, greenish-red, the sepals shorter than yellow stamens: frs. many-ribbed, sessile. Mts. of Eu.

glaucum. To 4 ft., glaucous: lvs. decompound, the segms. ovate, 3-lobed and toothed: fls. bisexual, in dense clusters in the panicle, yellow, the sepals shorter than stamens: fr. striate, sessile. S. Eu.

intermedium: hort. name for a form with pale yellow fls.

kemense: *T. minus.*

majus. Very similar to *T. minus* but much larger, to 4 ft., with sts. leafy to base, and branches of panicle spreading or drooping. Eu., Asia.

minus (*T. kemense. T. saxatile. T. ruthenicum*). To 1½ ft.: lvs. decompound, the segms. roundish, small, 3-lobed: fls. bisexual, greenish-yellow: frs. 8-ribbed, spindle-shaped, sessile. Eu., N. Afr., Asia.

paniculatum: a hort. name of uncertain application.

petaloideum. To 1½ ft.: lvs. decompound, the segms. ovate, entire or 3-lobed: fls. bisexual, in corymbs, with white sepals, pink filaments and yellow anthers: frs. striate, sessile. N. Asia.

polycarpum. To 3 ft. and more, diœcious: lvs. decompound, the segms. ovate, toothed or lobed: fls. whitish or greenish, with long stamens: frs. in dense heads, slightly inflated, short-stalked. Calif. to Ore.

polygamum (*T. Cornuti. T. corynellum*). To 8 ft. and more: lvs. decompound, the segms. oblong to orbicular, 3-lobed: fls. polygamous, the white sepals about length of stamens: frs. with 6–8 wings or ribs, short-stalked. E. N. Amer.

rugosum: a confused name.

ruthenicum: *T. minus.*

saxatile: *T. minus.*

simplex. Glabrous, strict, 2–3½ ft., sts. angled: upper lvs. with very long narrow divisions: infl. very narrow, little branched; fls. small: fr. striate, sessile. Eu., Asia.

squarrosum. Lvs. decompound, the lfts. ovate, 3-parted or entire: fls. white or yellow, drooping. Siberia.

sulphureum: listed name.

THAMNOCALAMUS. *Gramineæ.* Bamboos often considered a section of Arundinaria, differing in the lvs. not conspicuously tessellate and in technical floral characters; native in the mts. of Asia. See *Bamboo.*

aristatus (*Arundinaria aristata*). To 12 ft., with yellow sts.: lvs. to 4 in. long and ½ in. wide, glabrous, rugose, rough on edges, the sheaths with a stiff point. Himalayas.

Falconeri (*Arundinaria Falconeri. A. nobilis*). To 60 ft.: lvs. to 4 in. long and ½ in. wide, glabrous, finely toothed, the sheaths truncate at tip. Himalayas.

Hindsii (*Arundinaria Hindsii. A. erecta. Bambusa gracilis*). To 12 ft., sts. dark olive-green: lvs. to 8 in. long and ¾ in. wide, glaucous beneath, glabrous. China, Japan.

THEA. *Theaceæ* (*Ternstrœmiaceæ*). Evergreen shrubs and trees from Asia with alternate simple toothed lvs., showy white or pink nodding fls. which are usually solitary, and capsular fr.; distinguished from Camellia (with which the genus is sometimes united) chiefly by the pedicelled nodding fls. and persistent sepals. From the lvs. of *T. sinensis* is made the tea of commerce; also grown for ornament. For cult. see *Camellia.*

assamica: *T. sinensis* var.

Bohea: *T. sinensis* var.

cuspidata (*Camellia cuspidata*). Shrub to 6 ft.: lvs. to 3 in. long: fls. white, 1½ in. across. China.

japonica: *Camellia japonica.*

Sasanqua: *Camellia Sasanqua.*

sinensis (*Camellia Thea*). TEA. Shrub or tree to 30 ft.: lvs. to 5 in. long: fls. white, fragrant, to 1½ in. across. China, India; can be grown in southern states. Var. **assamica** (*T. assamica*) has fls. 1–4 together; in var. **Bohea** (*T. Bohea*) the lvs. are dark green and fls. usually solitary; var. **cantoniensis** has solitary terminal fls.; the lvs. of var. **viridis** (*T. viridis*) are light green and fls. 1–4 together.

viridis: *T. sinensis* var.

THEACEÆ or **TERNSTRŒMIACEÆ.** TEA FAMILY. About 16 genera of trees and shrubs, sometimes evergreen, native in warm regions, with commonly alternate simple lvs., regular bisexual fls. having mostly 5 sepals and petals, numerous stamens, superior 2–10-celled ovary, and fr. a caps. or drupe. The family furnishes the tea-leaf of commerce and the following genera of ornamentals: Camellia, Eurya, Gordonia, Schima, Stewartia, Ternstrœmia, Thea.

THELESPERMA. *Compositæ.* Glabrous herbs or subshrubs, ann. or per., of about 10 species in W. N. Amer. and S. S. Amer., one of them grown in the flower-garden; differs from Coreopsis in technical characters, as the inner involucral bracts united to the middle or above.

ambiguum. Per. to 1½ ft.: heads with broad yellow rays ½ in. long and purple disk turning brown. Colo.

Burridgeanum (*T. hybridum. Cosmidium Burridgeanum*). Ann. to 1½ ft., branching: lvs. divided into thread-like lobes: heads long-peduncled, to 1½ in. across, the rays red-brown or deep orange with yellow margin. Tex.—Formerly erroneously considered to be a hybrid between a Thelesperma and Coreopsis. Of easy cult. as a garden ann. in an open exposure, as for Coreopsis.

hybridum: *T. Burridgeanum.*

THELOCACTUS. *Cactaceæ.* A dozen Mexican or Texan globular or somewhat depressed spiny cacti of medium size, of which all the older species have been named in Echinocactus: ribs low or often indefinite (or apparently absent) and few in number and divided into large prominent tubercles: fls. from near center of plant, bell-shaped, diurnal. See *Cacti*.

bicolor (*Echinocactus bicolor*). Simple, globose to conic, to 4 in. diam., glaucous, very spiny, ribs commonly 8, spines colored, the radials 9–18 and centrals mostly 4: fls. purplish-pink, 2 in. or more long. S. Tex., Mex.

heterochromus: *T. Pottsii.*

hexædrophorus (*Echinocactus hexædrophorus*). Globose or somewhat flattened or hollowed on top, glaucous, not ribbed but strongly tubercled, radials 6–9, central 1 and stouter: fls. purplish, about 2 in. long. Cent. Mex.

leucacanthus (*Echinocactus leucacanthus*). Densely cespitose, individuals short-cylindric to 6 in. long, ribs 8–13, radials 7–20 and at first yellow, central solitary and to 2 in. long: fls. yellow, 2 in. long. Mex.

lophothele (*Echinocactus lophothele*). Cespitose in the wild, individuals globose, depressed or short-cylindric to 10 in. high, glaucous, ribs indefinite, tubercles flattened, radials 3–5, central 1 or none: fls. salmon or yellow, about 2 in. across. Mex.

Pottsii (*Echinocactus Pottsii* and *heterochromus*). Globular or depressed, to 6 in. diam., yellowish, ribs 8 or 9, radials 7–10, centrals several: fls. light purple, about 2 in. long. Mex.

THELYPODIUM. *Cruciferæ.* N. American ann., bien. and per. erect herbs glabrous or nearly so, one sometimes transferred to grounds: lvs. simple, entire or toothed, sometimes pinnatifid: fls. white or purplish, in racemes: fr. a linear pod or silique.

Wrightii (*Stanleyella Wrightii*). Slender branched ann. or bien. to 2½ ft.: lvs. lanceolate to linear, toothed to pinnatifid, the upper ones sometimes entire: fls. white. Colo. and Utah south.

THELYPTERIS: *Dryopteris.*

THEOBROMA. *Sterculiaceæ.* Trop. American trees with alternate simple entire lvs., small fls. in axillary clusters or borne on the branches and trunk, and large woody frs. from the seeds of which are obtained commercial cocoa and chocolate.

Cacao requires tropical temperatures and trees are planted in groves 10–15 feet apart each way. Propagated by seeds, the seedlings set permanently when 1–2 feet high. Trees will bear in about four years.

Cacao. CACAO. To 25 ft., evergreen: lvs. leathery, to 1 ft. long: fls. yellowish: fr. red to brown, ribbed, to 1 ft. long, the seeds to 1 in. across. Cent. and S. Amer.

THEOPHRASTACEÆ. THEOPHRASTA FAMILY. Five trop. genera of evergreen trees or shrubs: lvs. simple: fls. bisexual or unisexual, gamopetalous, with 5-lobed calyx and corolla, 5 or rarely 4 stamens, 5 staminodia, and superior 1-celled ovary: fr. indehiscent, leathery or fleshy. Clavija may be planted in S. U. S.

THERMOPSIS. *Leguminosæ.* Per. herbs with lvs. of 3 digitate lfts., leaf-like stipules, papilionaceous fls. in racemes, and flattened or inflated pods; native in N. Amer. and N. and E. Asia.

They are suited to deep well-drained soil; planted for ornament. Propagated by seeds sown in fall or spring over heat; also by division.

caroliniana. To 5 ft.: fls. yellow, in erect terminal racemes: pods flat, 2 in. long, tomentose. N. C. to Ga.

fabacea. To 3 ft.: fls. yellow, in erect axillary racemes: pods flat, to 3 in. and more long. Siberia.

fraxinifolia. To 3 ft.: fls. yellow, in loose racemes: pods linear, to 4 in. long, glabrous. N. C. to Ga.

mollis. To 3 ft.: fls. yellow, the racemes mostly terminal: pods flat, slightly curved, to 4 in. long, glabrous. S. Va. to Ga.

montana. To 2 ft.: fls. yellow, in terminal racemes: pods linear, 2 in. or more long, pubescent. Mont. to Wash.

rhombifolia. To 1 ft.: fls. yellow, in terminal or axillary racemes: pods to 2½ in. long, pubescent. Sask. to Colo.

THEROFON: *Boykinia.*

THERORHODION: *Rhododendron kamtschaticum.*

THESPESIA. *Malvaceæ.* Trop. trees and shrubs or tall herbs in Afr., Asia and Pacific Isls., with alternate mostly entire or angle-lobed lvs. and large showy yellow or red fls. with 3–5 small or deciduous bractlets; fr. a woody mostly indehiscent caps.; one is planted for ornament in the tropics and S. Fla. The wood is also used for making furniture. Propagated by seeds.

grandiflora: *Montezuma speciosissima.*

populnea. PORTIA-TREE. To 60 ft., more or less finely scaly: lvs. cordate-ovate and acuminate, somewhat poplar-like, to 5 in. long: fls. yellow changing to purple, to 3 in. across. Tropics of Old World.

THEVETIA. *Apocynaceæ.* Trop. American shrubs and trees with alternate lvs., large funnelform fls. in terminal cymes, and fr. a fleshy drupe.

One is grown under glass, and out-of-doors in the South. It thrives in rich sandy soil and can stand a few degrees of frost if banked with dry sand. Propagated by cuttings.

nereifolia (*Cerbera Thevetia*). YELLOW OLEANDER. To 30 ft., evergreen: lvs. to 6 in. long and ¼ in. wide: fls. yellow, fragrant, 2–3 in. long: fr. black, 1 in. across, hard and angled.

THIMBLEBERRY: *Rubus occidentalis.*

THISTLE, BLESSED: *Cnicus, Silybum Marianum.* **Fishbone**: *Cirsium Diacantha.* **Globe**: *Echinops.* **Golden**: *Scolymus hispanicus.* **Holy**: *Silybum Marianum.* **Milk**: *Silybum Marianum.* **Plumed**: *Cirsium.* **Plumeless**: *Carduus.* **Russian**: *Salsola pestifer.* **St. Marys**: *Silybum Marianum.* **Scotch**: *Onopordum Acanthium.*

THLASPI. PENNY-CRESS. *Cruciferæ.* Ann. and per. herbs of temp. and cold regions, for the most part glabrous and glaucous, erect: lvs. oblong to broad-ovate, entire or toothed, basal ones forming rosette, on st. auriculate: fls. white, rose or purplish, in racemes: fr. mostly a flat short winged silicle or pod.

A few species are grown in the rock-garden and others for the large flat ornamental pods often useful in dry bouquets. The cultivation is simple from seed, and some of the perennials by division.

alpestre. Glabrous per. to 12 in. in fr., in tufts: basal lvs. obovate and stalked: fls. white, mostly reddish tinged, in rather open infl. High mts. Eu.—The Rocky Mt. plant formerly referred here is **T. coloradense**, to 6 in.: fls. white, in dense head.

arvense. Rather weedy ann. to 18 in., strong plants branching above: st.-lvs. oblong to lanceolate, dentate, only the upper ones clasping: interesting for its flat nearly orbicular pods to ½ in. across. Eu., also nat.

cilicicum (*Carpoceras cilicicum*). Per., dwarf: lower lvs. ovate, entire, upper clasping: pods linear. Asia Minor.

coloradense: see *T. alpestre.*

montanum. Per. to 8 in., with stolons at base: lvs. entire or dentate, basal ones obovate, others oblong: fls. white. Mts., Cent. and S. Eu.

rotundifolium. Per., cespitose, with stolons, to 8 in.: lvs. thick, entire or dentate, basal ones roundish to obovate, others oval: fls. lilac. Mts., S. Eu.

stylosum. Little alpine per.: lvs. tufted, spatulate, 1/4 in. long, entire: fls. rose, in dense racemes 1 in. or so high. Italy.

THOMASIA. *Sterculiaceæ.* Australian shrubs with alternate entire or lobed lvs., purple or white fls. without petals borne in racemes, and capsular frs.; the first species grown as a ground-cover in S. Calif.

purpurea. Small subshrub: lvs. oblong or linear, to 1 in. long, stellate-hairy particularly beneath: fls. small, in racemes longer than lvs.

rugosa. Lvs. cordate-ovate, lobed, to 3 in. long, wrinkled and stellate-hairy above, densely tomentose beneath: fls. rather large.

THORNAPPLE: *Cratægus.*

THORN, BOX-: *Lycium.* **Camel-:** *Acacia Giraffæ.* **Christ-:** *Paliurus Spina-Christi.* **Cockspur:** *Cratægus Crus-galli.* **Hedge-:** *Carissa Arduina.* **Jerusalem-:** *Paliurus Spina-Christi, Parkinsonia aculeata.* **Kangaroo-:** *Acacia armata.* **Lily-:** *Catesbæa spinosa.* **Mysore:** *Cæsalpinia sepiaria.* **Washington:** *Cratægus Phænopyrum.*

THOROUGH-WAX: *Bupleurum.*

THOROUGHWORT: *Eupatorium.*

THRIFT: *Statice.* **Prickly-:** *Acantholimon.*

THRINAX. *Palmaceæ.* Eight or 10 small or slender unarmed hermaphrodite fan-palms native in S. Fla., W. Indies and Cent. Amer., with infl. among the nearly or quite orbicular lvs., the solitary trunk naked or clothed with old lf.-stalks: spadix longer than petiole and sometimes surpassing the blade, bearing many rather short side branches on a long continuing axis; stamens mostly 6: fr. globose, pea-like, white or light colored, flesh white, often on slender pedicels that remain when the drupe falls; albumen homogeneous and the small seed smooth and even. For cult. see *Palm.*

altissima: name not identified; see *Coccothrinax argentea.*

argentea: *Coccothrinax argentea.*

barbadensis: *Coccothrinax barbadensis.*

elegans, elegantissima: unidentified names.

excelsa: probably a Coccothrinax.

floridana. To 25–30 ft.: lvs. 2–3 ft. across, silvery-white underneath, yellowish-green above: fls. on slender pedicels about 1/8 in. long: fr. 3/8 in. diam., with thick flesh. S. Fla.—Perhaps not different from the W. Indian *T. parviflora.*

keyensis: see *T. microcarpa.*

microcarpa. To 30 ft. or more: lvs. about 2 ft. across, silvery-white underneath and tomentose when young, pale green above; petioles slender: fls. on very short thick disk-like pedicels: fr. about 1/8 in. diam., with thin flesh. S. Fla., Bahamas, W. Indies.—*T. keyensis,* of the Fla. Keys and Bahamas, differs in spadix 6 ft. rather than 3 ft. long and lvs. nearly or quite twice as broad.

Morrisii. Low, 3–4 ft., making a mound-like specimen, the trunk sometimes elongating: lvs. nearly orbicular, to 3 1/2 ft. across, glaucescent but not silvery-white underneath, deeply cleft into about 30 segms.: fls. on very short pedicels or sessile: fr. spherical, about 3/16 in. diam. Anguilla and Porto Rico.

parviflora: see *T. floridana.*

radiata: dubious name; the plant so called in cult. is probably *Coccothrinax argentea.*

Wendlandiana. To 25 ft.: lvs. 2–3 ft. across, nearly or quite orbicular, light yellowish-green above and paler green underneath, with 50 or more segms.: fls. on pedicels about 1/8 in. long: fr. globose, 3/8 in. or less diam. Cuba, Honduras, and supposed to be native also in S. Fla.

THRINCOMA ALTA: *Coccothrinax argentea.*

THRIXSPERMUM. *Orchidaceæ.* Old World epiphytes with leafy sts. and fls. in racemes, usually only one open at a time, the sepals and petals nearly equal, the lip 3-lobed and sac-like at base. See *Orchids* for cult.

calceolus (*Sarcochilus calceolus*). Sts. to 3 ft. high with lvs. to 5 in. long: fls. snow-white, the lip yellow at base, 2 in. across, in few-fld. racemes. Malaya.

THROAT: the opening or orifice into a gamopetalous corolla or perianth; the place where the limb joins the tube.

THROATWORT: *Trachelium.*

THRYALLIS. *Malpighiaceæ.* Trop. American shrubs or somewhat tree-like, with opposite simple lvs., yellow or reddish fls. in panicles, and fr. a caps. separating into 3 parts; grown under glass (propagated by cuttings in heat) or out-of-doors in the S.

brasiliensis: see *T. glauca.*

glauca (*T. gracilis. Galphimia glauca*). Neat floriferous glaucous bush to 5 ft.: lvs. oblong, to 2 in. long: fls. yellow, 3/4 in. across, in many-fld. panicles. Mex. to Panama, and nat. elsewhere.—Sometimes grown as *T. brasiliensis,* but that species is smaller-fld. and probably not in cult.

gracilis: *T. glauca.*

THUJA. ARBOR-VITÆ. *Pinaceæ.* Evergreen trees of N. Amer. and E. Asia, having frond-like branchlets, scale-like lvs. or when young needle-shaped, and erect ovoid-oblong small cones with few scales. For cult. see *Conifers.* Although the thujas may make tall trees in nature, in plantations they are usually prized for their slow compact growth, and the dwarf garden forms are very many.

dolobrata: *Thujopsis dolobrata.*

gigantea: *T. plicata.*

japonica: *T. Standishii.*

koraiensis. Spreading shrub or rarely tree to 25 ft.: lvs. glaucous beneath, glandular: cones 1/3 in. long. Korea.

Lobbii: *T. plicata.*

occidentalis. AMERICAN A. To 60 ft.: lvs. yellowish-green beneath, glandular: cones 1/2 in. long. N. S. to N. C. and Ill. There are many hort. vars., as: **alba,** QUEEN VICTORIA A., tips of young branchlets white; **aurea,** of bushy habit, lvs. deep yellow; **aureo-variegata,** lvs. variegated with golden-yellow; **Boothii,** low and compact with rather large lvs.; **Buchanani,** narrow-pyramidal grayish-green form; **Burrowii,** lvs. yellow; **Columbia,** lvs. variegated with silver; **compacta,** of dense habit; **conica,** cone-shaped; **cristata,** dwarf with stout crowded branchlets; **densiforma,** very dense; **Douglasii aurea,** lvs. bronzy-yellow; **Douglasii pyramidalis,** dense pyramidal form with fern-like branches; **dumosa,** dwarf dense form; **Ellwangeriana,** low form with both adult and juvenile lvs. and in **aurea** lvs. yellow; **ericoides,** dwarf or bushy form with needle-shaped lvs.; **fastigiata** (var. *pyramidalis,* var. *stricta,* var. *columnaris*), columnar, branches short; **filicoides,** of narrow-pyramidal habit and pinnately arranged branchlets; **filiformis,** bushy form with long slender branchlets; **globosa** (var. *Spihlmannii,* var. Tom Thumb), dwarf globose form, lvs. bright green; **Hoveyi,** of dwarf globose habit and bright green foliage; **intermedia,** dwarf and compact; **lutea** (var. *elegantissima*), GEORGE PEABODY A., of pyramidal habit, with bright yellow lvs.; **lutescens,** yellow-lvd. form of var. *robusta*; **nana,** dwarf and compact; **Ohlendorfi** (var. *Spæthii*), of bushy habit, with 2 kinds of lvs.; **pendula,** branches bending downward; **plicata,** pyramidal form with much flattened branchlets; **pumila** (var. Little Gem), dwarf and dense, lvs. dark green; **pygmæa**, dwarf; **Reidii**, dwarf broad form; **Riversi**, of compact pyramidal habit, lvs. yellowish-green; **robusta** (var. *Wareana*), lower and denser than the type; **Rosenthali**, columnar, lvs. glossy dark green; **semperaurea**, lvs. golden-yellow; **spiralis**, branchlets appearing as if spirally arranged; **theodonensis**, branchlets thick and broad; **umbraculifera**, dwarf with umbrella-like top; **variegata** (var. *argentea*), branchlets variegated white; **Ervæneana**, smaller and denser with bronzy branchlets in winter; **viridis**, of narrow-pyramidal habit and glossy dark green lvs.; **Wagneriana**, globose dark green; **Woodwardii**, dense and globose, lvs. deep green. The name *gallica* is listed.

orientalis (*Biota orientalis*). Oriental A. To 60 ft.: lvs. bright green, glandular: cones to 1 in. long. China, Korea; less hardy than the American arbor-vitæ. Some of the garden vars. are: **argenteo-variegata** (*B. orientalis* var. *argentea*), tips of young shoots creamy-white; **aurea**, golden-yellow in spring; **Bakeri**, foliage pale green, adapted to hot dry locations; **beverleyensis**, of pyramidal habit, lvs. golden-yellow; **compacta**, dwarf and compact; **conspicua** (var. *aurea conspicua*), compact, golden-yellow suffused with green; **decussata**, dwarf juvenile form with bluish-green lvs.; **elegantissima**, compact, bright yellow in spring; **flagelliformis** (var. *pendula*, *B. orientalis* var. *filiformis*), branches drooping and thread-like; **funiculata**, branchlets drooping, lvs. of 2 kinds; **gracilis**, slender pyramidal form; **intermedia**, branchlets drooping, lvs. of 2 kinds; **meldensis**, narrow-pyramidal form with needle-like lvs.; **semperaurescens**, dwarf, lvs. golden-yellow; **Sieboldii** (var. *nana*, var. *compacta*), low and globose; **stricta** (*B. orientalis* var. *pyramidalis*), of dense pyramidal habit. The names *Berckmanniana* and *bonita* are listed.

pachyphylloides: listed name.

plicata (*T. gigantea*. *T. Lobbii*). Giant A. To 200 ft.: lvs. with whitish marks below, usually not glandular: cones ½ in. long. Alaska to Calif.; in the N. should not be exposed to strong winter winds. Var. **atrovirens** has dark green lvs., var. **aurea** yellowish lvs., var. **fastigiata** columnar habit, and var. **pendula** drooping branches.

Standishii (*T. japonica*). Japanese A. To 50 ft.: lvs. with triangular white marks below, not glandular: cones to ½ in. long. Japan.

THUJOPSIS. *Pinaceæ.* One evergreen pyramidal tree to 50 ft., allied to Thuja, native in Japan. **T. dolobrata** (*Thuja dolobrata*). Hiba Arbor-Vitæ. False Arbor-Vitæ. Branchlets flattened and frond-like: lvs. appressed, glossy above, with broad white band beneath: cones ovoid, about ½ in. long, with flat woody scales. Var. **Hondai** is taller with smaller lvs. Var. **nana**, dwarf, lvs. lighter green. Var. **variegata**, tips of branchlets creamy-white. Hardy in central states, and in S. New England can be grown in sheltered situations near the coast. *T. borealis* is *Chamæcyparis nootkatensis*. For cult. see *Conifers*.

THUNBERGIA. Clock-Vine. *Acanthaceæ.* Trop. herbs or shrubs, often climbing, with opposite lvs. and funnelform 5-lobed fls. subtended by 2 large bracts, in shades of blue, purple, yellow or white, and blooming mostly in late summer and autumn.

Thunbergias are popular in southern United States for covering porches, trellises and arbors, and are also grown in the North under glass. Propagated by seeds, cuttings of young growth, and by layers in summer.

alata. Black-eyed Susan. Twining per. herb sometimes grown as an ann. from seeds: lvs. triangular-ovate, to 3 in. long, toothed, with winged petiole: fls. creamy with dark purple throat, 1½ in. long, solitary on long peduncles. Trop. Afr.; widely nat. in tropics.

coccinea. Woody twiner: lvs. ovate, to 5 in. long, thick, 3–5-nerved from base, toothed: fls. scarlet with yellow throat, 1 in. long. in drooping racemes. India.

erecta (*Mayenia erecta*). Erect shrub to 6 ft.: lvs. ovate, to 3 in. long, nearly entire: fls. blue-purple with yellowish-white tube, to 2¾ in. long, solitary. Trop. Afr. Var. **alba** has white fls.

fragrans. Woody twiner: lvs. lanceolate to triangular-ovate, to 3 in. long, nearly entire: fls. white, fragrant, 1¼ in. long and 2 in. across, solitary. India.

Gibsoni. Twining per. herb: lvs. ovate, to 3 in. long, toothed, with winged petioles: fls. orange, 1¾ in. long and broad, solitary on long hairy peduncles. Trop. Afr.—Readily grown as an ann. from seeds.

grandiflora. Woody twiner: lvs. ovate, to 8 in. long, 3-nerved from base, very rough, angle-toothed: fls. blue (or white), somewhat 2-lipped, to 3 in. long and broad, usually in drooping racemes. India; nat. in tropics, and common in cult. for arbors and porches.

Harrisii: *T. laurifolia.*

laurifolia (*T. Harrisii*). Woody twiner: lvs. lanceolate or ovate-lanceolate, coriaceous, to 5 in. long, nearly entire, 3-nerved from base: fls. light blue with white or yellowish throat, 3 in. across, in racemes. India.

THUNIA. *Orchidaceæ.* Epiphytic or terrestrial orchids with leafy bamboo-like or reed-like sts. terminating in drooping 5–10-fld. racemes, the sepals and petals similar, the lip overlapping around column, spurred and crested. See *Orchids* for cult.

alba. To 2 ft.: lvs. to 4½ in. long: fls. white, the lip marked with yellow and violet, to 2½ in. long, July–Aug. India. Var. **Marshalliana** (*T. Marshalliana*), fls. white with yellow lip and orange fringed keels, June–July.

Bensoniæ. To 2 ft.: lvs. to 10 in. long: fls. white at base tipped with purple, the lip fringed and with yellow crests, to 3 in. long, June–Aug. Burma.

Marshalliana: *T. alba* var.

THYME: *Thymus*. **Spanish**: *Coleus amboinicus.*

THYMELÆACEÆ. Mezereum Family. Nearly 40 widely distributed genera of trees and shrubs or rarely herbs, temp. and trop. in both hemispheres, with simple lvs., regular bisexual or diœcious fls. having 4–5-lobed petaloid calyx like a corolla, no petals, 2-many stamens, and superior 1–2-celled ovary. Some genera have medicinal and economic uses and Dais, Daphne, Dirca, Edgeworthia, and Pimelea are planted for ornament.

THYMUS. Thyme. *Labiatæ.* Aromatic shrubs or subshrubs, evergreen or partially so, classed with sweet herbs, with small entire lvs., and somewhat 2-lipped fls. in few-fld. whorls which are axillary or in terminal clusters; used in borders, rock-gardens and as a seasoning. Propagated by division or seeds.

azoricus: *T. Serpyllum.*

citriodorus: *T. Serpyllum* var. *vulgaris.*

Marschallianus: a name of uncertain application.

micans: *T. Serpyllum.*

nitidus. Shrub: lvs. ovate or oval-oblong, shining above: calyx purple at tips. Sicily.

Serpyllum (*T. micans*. *T. azoricus*). Mother-of-Thyme. Creeping T. Prostrate subshrub, the sts. rooting: lvs. ovate to oblong, to ½ in. long, short-petioled: fls. purplish, ¼ in. long, June–Sept. Eu., Asia, N. Afr.; nat. in N. Amer. There are many hort vars. as: **albus**, fls. white; **argenteus**, lvs. variegated with silver; **aureus**, lvs. variegated with yellow; **coccineus**, to 3 ft., fls. crimson; **lanuginosus**, lvs. and infl. gray-pubescent; **roseus**, fls. rose; **splendens**, fls. red; **variegatus**, lvs. variegated with white; **vulgaris** (*T. citriodorus*), Lemon T., lvs. small and lemon-scented.

vulgaris. Common T. Erect subshrub to 8 in. the branches usually white-pubescent: lvs. ovate to linear, to ½ in. long, nearly sessile, revolute: fls. lilac or purplish, ¼ in. long, May–June. S. Eu.

THYRSACANTHUS: *Odontonema*.

THYRSE: compact and more or less compound panicle; more correctly a panicle-like cluster with main axis indeterminate and other parts determinate.

THYSANOLÆNA. *Gramineæ*. One large grass to 12 ft. high, native in trop. Asia. T. Agrostis. Lvs. to 2 ft. long and 4 in. wide, leathery: spikelets pale yellow, borne on thread-like branches in panicles to 2 ft. long.—Intro. in S. Calif.

THYSANOTUS. *Liliaceæ*. Australian perennials with fibrous or tuberous roots, grass-like basal lvs. and fls. usually in umbels, the perianth-segms. distinct, the 3 inner fringed on edges. Propagated by offsets.

dichotomus. To 2 ft., rarely somewhat twining: lvs. short, soon withering: fls. purple, ½ in. long, in 1–3-fld. terminal umbels.—Intro. in Calif.

TIARELLA. False Mitrewort. *Saxifragaceæ*. Slender erect hardy herbaceous woods perennials for colonizing, for the wild or rock-garden or any shady situation, especially attractive in the autumn for the brilliant color of the foliage: lvs. radical, simple or 3-foliate: fls. reddish or whitish, in simple or compound racemes; stamens 10: N. Amer. and Asia. Propagated by division and by seed when obtainable.

cordifolia. Foam-Flower. To 1 ft., tufted: lvs. broadly cordate, to 4 in. across, lobed and toothed: racemes simple. N. S. to Ga. and Ala. Var. **purpurea** (*T. purpurea*), fls. purple and its variations **major**, salmon-rose or wine-red, **marmorata**, very attractive bronze foliage passing to blackish-green, marbled with purple, fls. numerous, maroon.

polyphylla. To 1½ ft.: lvs. cordate-ovate, to 3 in. across, wavy-toothed: fls. in racemes. Himalayas.

purpurea: *T. cordifolia* var.

unifoliata. To 2 ft.: lvs. cordate-ovate, to 4 in. across, 3–5-lobed: fls. in panicles. Alaska to Calif.

TIBOUCHINA. Glory-Bush. *Melastomaceæ*. Trop. American tree-like shrubs or rarely herbs with simple 3–5-nerved lvs., large fls. in terminal panicles or solitary, and capsular frs.: grown under glass or out-of-doors in the S. where they will stand a few degrees of frost. Propagated by cuttings under glass.

elegans (*Pleroma elegans*). To 6 ft.: lvs. oblong: fls. purple, 1½ in. across, calyx bristly. Brazil.

semidecandra (*Pleroma macranthum* and *splendens*). To 10 ft.: lvs. ovate or oblong-ovate, to 4 in. long, densely hairy on both sides and pale beneath: fls. purple, to 5 in. across. Brazil.

TICANTO: *Cæsalpinia Nuga*.

TICKSEED: *Bidens, Coreopsis*.

TIDY TIPS: *Layia elegans*.

TI-ES: *Lucuma nervosa*.

TIGER-FLOWER: *Tigridia*.

TIGRIDIA. Tiger-Flower. *Iridaceæ*. Bulbous herbs native from Mex. to Chile having narrow st.-lvs. and leaf-like spathes bearing 1 or more erect fls. without perianth-tube, the segms. forming a broad cup at base.

Bulbs should be planted 2–3 inches deep in late spring and will bloom in July or August. They should be lifted before frost and stored in a dry place over winter. Propagated by offsets and seeds.

conchiflora: *T. Pavonia* var.

Pavonia. To 2½ ft.: fls. red oddly spotted with yellow and purple, to 6 in. across, showy, lasting a day and succeeded by others. Mex., Guatemala.—There are forms with lilac, yellow, and white fls. Var. **grandiflora** has larger fls. Var. **conchiflora** has bright yellow fls.

TILIA. Linden. Lime. Basswood. *Tiliaceæ*. Trees with alternate usually heart-shaped toothed lvs., small, fragrant, white or yellowish fls. in drooping clusters, and nut-like frs. whose peduncles are partially united to a broad membranaceous bract; good ornamental subjects, also furnishing valuable timber and fiber from the inner bark. The species are confused.

The lindens are not particular as to soil but do not withstand drought. Propagated by seed in autumn or stratified and sown in spring, by layers, mound-layering, and cuttings. The named kinds are commonly grafted in spring or budded in summer on available common stocks.

alba: a name of inexact application.

americana (*T. glabra*). American L. To 120 ft.: lvs. broad-ovate, to 6 in. or more long, abruptly acuminate, teeth long-pointed, glabrous beneath except in vein-axils, turning yellow in autumn. N. B. to Mo. Var. **dentata** (*T. longifolia dentata*), lvs. coarsely irregularly toothed. Var. **macrophylla** (var. *mississippiensis*, *T. laxiflora*) has larger lvs.

argentea: *T. tomentosa*.

cordata (*T. ulmifolia*). Small-leaved L. To 100 ft.: lvs. to 2½ in. long, glaucous beneath and also glabrous except in axils of veins. Eu.

dasystyla. Lvs. broad-ovate, aristate-toothed, to 6 in. long, shining above, hairy in axils beneath. W. Asia.—Most of the material cult. under this name is *T. euchlora*.

euchlora. Crimean L. Hybrid between *T. cordata* and *T dasystyla*, with dark green glossy lvs. paler beneath and glabrous underneath except for axillary tufts.

europæa: *T. vulgaris*.

flavescens. Hybrid between *T. cordata* and *T. glabra*: lvs. 3 in. long, glabrous beneath.

floribunda: a form of *T. flavescens*.

glabra: *T. americana*.

heterophylla. To 60 ft.: lvs. ovate, gradually tapering, aristate-serrate, shining above at maturity, to 7 in. long, white-tomentose or pubescent underneath. Ind. to Fla.—Perhaps it would be better treated as *T. americana* var. *heterophylla*.

japonica. Japanese L. To 60 ft.: lvs. to 3 in. long, closely sharp-serrate, not lobed, glabrous beneath at maturity but bluish-green and pubescent on veins when young. Japan.

laxiflora: *T. americana* var. *macrophylla*.

longifolia dentata: *T. americana* var. *dentata*.

macrophylla: *T. americana* var.

mandshurica. To 60 ft.: lvs. round-ovate, short-acuminate, teeth with long points, to 6 in. long, gray- or white-tomentose beneath and little pubescent above. N. E. Asia.

mississippiensis: *T. americana* var. *macrophylla*.

Moltkei (*T. spectabilis*). Hybrid between *T. glabra* and *T. petiolaris*: lvs. round-ovate, to 7 in. long, gray-tomentose beneath.

mongolica. Mongolian L. To 30 ft.: lvs. to 2½ in. long, coarsely serrate and mostly 3-lobed, shining above, glabrous beneath except in axils of veins, somewhat glaucous. Mongolia, N. China.

petiolaris. Weeping White L. To 80 ft., the branches pendulous: lvs. round-ovate, sharp-serrate, to 4½ in. long, white-tomentose beneath and slightly pubescent above, petiole longer than half the blade. Probably S. Eu., W. Asia.

platyphyllos. Large-leaved L. To 120 ft.: lvs. to 4 in. long, light green and lightly pubescent beneath at least on veins. Eu. Var. **aurea** has golden-yellow branchlets when young and var. **rubra** (var. *corallina*) red. In var. **laciniata** (var. *asplenifolia*) the lvs. are deeply cut. Var. **pyramidalis** is of pyramidal habit. Var. **vitifolia** has slightly 3-lobed lvs.

spectabilis: *T. Moltkei.*

tomentosa (*T. argentea*). White or Silver L. To 100 ft.: lvs. very broad-ovate, sharp-serrate, to 5 in. long, white-tomentose beneath and slightly pubescent above when young, petiole short. E. Eu., Asia Minor.

ulmifolia: *T. cordata.*

vulgaris (*T. europæa*) Hybrid between *T. platyphyllos* and *T. cordata:* lvs. to 4 in. long, glabrous and bright green beneath except for axillary tufts, dull green above.—Excellent street tree.

TILIACEÆ. Linden or Basswood Family. More than 30 widely distributed genera of trees, shrubs or rarely herbs, with usually alternate simple lvs., regular fls. having commonly 5 sepals and petals, or petals lacking, numerous stamens, superior 2–10-celled ovary, and fr. a drupe, caps. or berry. The following genera are cult. for ornament, fiber and timber: Corchorus, Entelea, Grewia, Sparmannia, Tilia.

TILLANDSIA. *Bromeliaceæ.* Mostly epiphytic American herbs with entire basal lvs. crowded or in rosettes, and blue, purple, red, orange or white fls. in spikes, heads or panicles; grown in the greenhouse and the Spanish-moss common on trees in the southern states where it is also used as a packing material and in manufacture. Cult. as for *Bromeliaceæ*; some species are large and stiffly erect and others drooping or hanging.

acaulis: *Cryptanthus acaulis.*

Duvaliana: *Vriesia Duvaliana.*

fasciculata. Lvs. linear-lanceolate, to 1½ ft. long, grayish-green: fls. blue, in many-fld. spikes to 6 in. long, on branched scapes to 2 ft. high, the bracts greenish tinged with red. W. Indies, Cent. Amer.

Lindeniana. Lvs. to 1 ft. long and ¾ in. wide: fls. bluish-purple, in large spikes, the bracts carmine. Ecuador, Peru.

nigrescens. Lvs. lanceolate: fls. white, the bracts bordered and tipped with red. Colombia.

usneoides (*Dendropogon usneoides*). Spanish-Moss. Sts. slender and hanging, often 20 ft. and more long, hoary-gray, festooned over the trees: lvs. scattered, to 3 in. long and very narrow: fls. yellow, small, solitary or 2 in axils of lvs. Fla. to Tex. and trop. Amer.

TIMOTHY: *Phleum pratense.*

TINANTIA. *Commelinaceæ.* Erect herbs native in trop. Amer., with alternate lvs. and fls. in terminal cymes; occasionally grown under glass or planted out in summer; has something of the habit of a tradescantia.

fugax. To 1½ ft.: lvs. ovate-lanceolate, to 4 in. long: fls. blue, about ½ in. long, July–Aug. Mex., S. Amer.

TIPUANA. Tipu-Tree. *Leguminosæ.* S. American trees with pinnate lvs., showy papilionaceous fls. in terminal panicles, and samara-like 1–3-seeded winged pods; planted for ornament in trop. regions and also a source of rosewood.

speciosa: *T. Tipu.*

Tipu (*T. speciosa. Machærium Tipu*). To 30 ft. and more: lfts. oblong, 1½ in. long: fls. yellow: pods to 2½ in. long.

TIPU-TREE: *Tipuana.*

TITANOPSIS. *Aizoaceæ.* Segregate from Mesembryanthemum (which see): like Nananthus, but lvs. more erect, spatulate and very obtuse, the apical part covered with crowded white tubercles: calyx sub-equally 6-lobed; stigmas, valves and cells of fr. 6, the cells roofed with membranous wings, ovary inferior. A few species have been mentioned in American literature, but apparently yet little known here.

TITHONIA. *Compositæ.* Herbs or shrubs with alternate lvs. and large yellow sunflower-like heads on thickened stalks, of ray- and disk-fls.; pappus of scales or none; native in Mex., Cent. Amer. and W. Indies and grown under glass or out-of-doors in the S.

diversifolia (*Mirasolia diversifolia*). Per. or shrub to 30 ft.: lvs. ovate or triangular, to 8 in. long, usually 3–5-lobed: heads to 6 in. across, orange-yellow. Mex., Cent. Amer.

rotundifolia (*T. speciosa*). Shrub to 6 ft.: lvs. broad-ovate, to 6 in. or more long, mostly crenate, sometimes 3-lobed: heads 3 in. across, orange-yellow. Mex., Cent. Amer.

speciosa: *T. rotundifolia.*

TITHYMALOPSIS: *Euphorbia.*

TITHYMALUS: *Euphorbia.*

TITI: *Cliftonia monophylla.*

TITOKI: *Alectryon excelsum.*

TIUM: *Astragalus.*

TOADFLAX: *Linaria.*

TOBACCO: *Nicotiana.* **Indian**: *Lobelia inflata.*

TOCOCA. *Melastomaceæ.* S. American shrubs with large simple 5-nerved lvs., showy white or rose fls. in terminal panicles, and fr. a berry.

Grown in a warm greenhouse in a moist shaded position. Leaf-mold mixed with fibrous loam is a good soil. Propagated by single-eye cuttings in January struck in sand and covered with glass; also by cuttings from the base of the shoot with a piece of stem attached.

platyphylla (*Sphærogyne latifolia*). Sts. bristly: lvs. broadly ovate, to 1 ft. long: fls. rose or red. N. S. Amer., Costa Rica.

TODDALIA: *Vepris lanceolata.*

TODEA: see *Leptopteris*

TOLMIEA. *Saxifragaceæ.* One per. herb grown in the rock-garden; much like Tiarella but stamens only 2 or 3. Propagated by adventitious buds which are produced at tips of petioles. **T. Menziesii.** To 2 ft.: lvs. mostly basal, cordate-ovate, to 3½ in. across, lobed and toothed: fls. green, ⅓ in. long, nodding, in long racemes. Alaska to Calif.

TOLPIS. *Compositæ.* Herbs of the Medit. region with mostly radical lvs. and yellow heads of ligulate fls.; pappus of bristles; one species sometimes grown for ornament. Propagated by seed.

barbata (*Crepis barbata*). Ann. to 1 ft.: lvs. lanceolate, toothed: heads about ½ in. long, the outer involucral bracts thread-like and similar bracts on the st. near the head. S. Eu.—The plant has been sold as "Golden Yellow Hawkweed."

TOLUIFERA: *Myroxylon.*

TOMATILLO: *Physalis ixocarpa.*

TOMATO (*Lycopersicon esculentum* and *L. pimpinellifolium*). Tender herbs grown as annuals for the much-prized fruits, both out-of-doors and under glass. The husk-tomato and strawberry-tomato are Physalis and the tree-tomato *Cyphomandra betacea.* The tomato is closely allied to potato, and it is possible to graft one on the other: see *Potomato*.

Tomatoes are started under glass or in protected seed-beds for the purpose both of producing early fruit and prolonging the bearing season. Seeds are sown in light fertile soil in pots, pans, or shallow boxes four to six or eight weeks before time for planting in the field. If started too early and not shifted the plants become pot-bound or else too long and weak from overcrowding. When plants have reached the height of 2 or 3 inches in the bed or seed-box they should be transplanted into 3-inch pots, old berry-boxes or other receptacles, and allowed to grow slowly and firmly until time to set them out, which is when all danger of frost is past. The young plants should not be allowed to become stunted. They should be in a vigorous growing condition when set out, full green and stocky, not slender and yellowed and with a blossom at the top. One ounce of seed should produce 1,500–2,000 good plants. The soil for tomatoes should be "quick,"—one in which the fertility is at once available; stimulating manures applied afterwards are likely to delay the fruiting.

Tomato plants may be set in rows 4 or 5 feet apart, the plants being the same distance in the rows. In the home garden support should be given to keep the fruits off the ground and to hasten the ripening. A trellis of chicken-wire makes an excellent support, as does light lath fencing that may be made at home. Stout stakes, with wire strung the length of the rows, also answers the purpose. A showy method is that of a frame made like an inverted V, which allows the fruits to hang free; with a little attention to trimming, the light reaches the fruits and ripens them perfectly. This support is made by leaning together two lath frames. When tomatoes are tied or trained they may be set 18–24 inches apart in the row. The late fruits may be picked green and ripened on a shelf in the sun; or they will ripen if placed in a drawer. If the family is fond of tomatoes, two or three sowings may be made in succession. The first sowings may be of the earliest varieties.

A good range of varieties is always available from seedsmen, and it is interesting to provide the home garden with yellow as well as the usual red kinds, also the small plum and cherry kinds for conserves. The currant tomato (*Lycopersicon pimpinellifolium*) is grown more for curiosity and ornament than for service because the many fruits are so small.

In field operations tomatoes are spaced for horse or power tillage, commonly about 4 feet apart in either direction, and are allowed to take their natural course without tying or training. Of canning tomatoes in field culture 5–8 tons to the acre is a good crop, but 12 or more tons are possible. The fruits are picked into crates, and for the green-grocery market they are sold in baskets, the better trade requiring the product to be graded. The tomato is now a staple product in North America, being grown in great quantities under general field conditions both for direct table use and for canning, the making of catsup and soups. Latterly the little cherry and plum tomatoes have been much grown for the fancy fruit and table trade.

Under glass the tomato is an important crop for late autumn, winter and spring trade. Seeds may be sown in June for the fall crop and in December to February for spring. Two to three shifts from seed-bed to permanent planting should provide vigorous unchecked stocky plants. From 4– or 6–inch pots the plants may go into the bed, which is usually solid; or they may be grown on benches for the midwinter product. How tomatoes are to be handled under glass depends greatly on the previous and subsequent crops to which the house is devoted. The soil should be fertile, and the essential plant-food quickly available. The rows under glass may be 24–30 inches apart, and the plants in the row at similar or somewhat less distances. The plants are ordinarily grown to single stems, supported on perpendicular wires or strings. The night temperature may be 65° F., but not below 60°. Over-watering is a common fault under glass, particularly in dull weather. When the plants are dry and the house is sunny, pollination may be insured by jarring the plants once or twice a day to discharge and scatter the pollen; some growers distribute the pollen with a camel-hair brush. Four to six pounds of fruit is a good winter crop from each plant; the spring crop may go higher. There are varieties particularly adapted to forcing.

Diseases of tomatoes may be controlled to considerable extent by employing clean seed, by burning all the crop refuse and thoroughly cleaning the area in autumn and by choosing resistant varieties or races. Leaf-spot and similar infections are treated by bordeaux and resin fish-oil applied with spray under pressure.

TOMENTOSE: with tomentum; densely woolly or pubescent; with matted soft wool-like hairiness.

TONTANEA: *Coccocypselum.*

TOOART-TREE: *Eucalyptus gomphocephala.*

TOOG: *Bischofia javanica.*

TOONA: *Cedrela.*

TOOTHACHE-TREE: *Zanthoxylum Clava-Herculis.*

TOOTHWORT: *Dentaria.*

TORENIA. *Scrophulariaceæ.* Herbaceous annuals and perennials usually somewhat decumbent and freely branching, with short few-fld. racemes, the fls. tubular, 2-lipped, produced freely from spring to frost; native in trop. Asia and Afr., a few grown in greenhouses for winter bloom but usually in the garden as annuals; in Fla. they are successfully used as a substitute for pansies.

Torenias require no special culture but prefer some shade and plenty of moisture. They are easily propagated by seed sown either inside or in the open early in the spring, or from cuttings.

asiatica. Ann.: fls. to 1½ in. long, corolla-tube dark purple, limb pale purple with a dark blotch on 3 of the 4 lobes. India.

Bailloni: *T. flava.*

flava (*T. Bailloni*). Ann. or grown as such: fls. to 1½ in. long, corolla-tube yellow, red-purple above, limb yellow with purple eye. India, E. Asia.

Fournieri. Ann. to 1 ft.: lvs. toothed, to 2 in. long: corolla-tube pale violet, yellow on the back, upper lip pale blue, lower lip with 3 purplish-blue lobes, yellow blotch at base of central one. Cochin-China. Var. **grandiflora** has larger fls. Var. **speciosa** is a showy hort. form.

peduncularis. Ann.: fls. ¾ in. long, pale blue. Malaya.

TORNILLO: *Strombocarpa odorata.*

TORREYA (*Tumion*). *Taxaceæ.* Six evergreen trees native in N. Amer. and Asia having narrow yew-like lvs. with 2 narrow glaucous bands beneath, diœcious fls. and drupe-like frs. For cult. see *Conifers.* Hardy in central and southern states and *T. nucifera* farther north. Distinguished from Taxus by the glaucous lines on under surface of lvs. and the drupe-like fr., as well as characters of anthers.

californica. California-Nutmeg. To 70 ft. and more: lvs. linear, to 2½ in. long, glossy dark green above: fr. green streaked purple. Calif.; can be grown N. E. in sheltered places but may become deciduous.

Fargesii. Differs from *T. grandis* in the darker green lvs. more gradually pointed. China.

grandis. To 75 ft.: lvs. linear, to 1 in. long, yellow-green above: fr. brownish. China.

nucifera. To 75 ft.: lvs. lanceolate, to 1¼ in. long, glossy dark green above: fr. green tinged purple. Japan; hardy in sheltered places N. E.

taxifolia. Stinking-Cedar. To 40 ft.: lvs. linear, to 1½ in. long, glossy dark green above, of fetid odor when bruised: fr. purple. Fla.

TORUS: receptacle.

TOUCH-ME-NOT: *Impatiens.*

TOUS-LES-MOIS: *Canna edulis.*

TOVARA. *Polygonaceæ.* One or possibly 2 herbaceous species separated from Polygonum on technical characters of fls. and infl. **T. virginiana** (*Polygonum virginianum*). Per. to 6 ft.: lvs. ovate, to 6 in. long, slightly glaucous beneath: fls. greenish or rose-colored, in clusters on an infl. to 1 ft. long. E. N. Amer., E. Asia. Var. **filiformis** (*Polygonum filiforme*) differs in obovate lvs. and fls. dark red at maturity.

TOWNSENDIA. *Compositæ.* Per. herbs of W. N. Amer. with alternate entire lvs. and many-fld. usually solitary heads of white, pink or purple ray-fls. and disk-fls.; pappus of bristles. A few species may be transferred to the wild-garden.

exscapa (*T. Wilcoxiana*). Stemless: lvs. linear-spatulate, to 2 in. long: heads to 2 in. across. Alta. to Ariz.

grandiflora. To 8 in. with st.: lvs. linear, to 2 in. long heads to 2 in. across. S. D. to New Mex.

Wilcoxiana: *T. exscapa.*

TOXICOPHLŒA: *Acokanthera.*

TOXICOSCORDION: *Zygadenus gramineus.*

TOXYLON: *Maclura.*

TOYON: *Heteromeles arbutifolia.*

TRACHELIUM. Throatwort. *Campanulaceæ.* Per. herbs or small shrubs native in the Medit. region, having alternate simple lvs., tubular 5-lobed blue fls., and capsular frs.; one species is grown as a greenhouse ann. or out-of-doors in the S. Propagated by seeds or cuttings.

cæruleum. To 3 ft., with the look of a valerian: lvs. ovate, to 3 in. long, toothed: fls. deep blue varying to white, ¼–½ in. long, in large terminal corymbs, the styles long-exserted. S. Eu.

TRACHELOSPERMUM. *Apocynaceæ.* Woody evergreen vines with opposite lvs., salver-shaped rather small fls. in terminal or axillary cymes, and fr. of 2 long follicles; native from E. India to Japan, one grown under glass and in the open S. Propagated by cuttings in spring.

asiaticum: see *T. jasminoides.*

divaricatum. Similar to *T. jasminoides* but with exserted stamens. Japan.

jasminoides (*Rhynchospermum jasminoides*). Star- or Confederate-Jasmine. Evergreen: lvs. oval to ovate-lanceolate, to 3 in. long: fls. white, fragrant, to 1 in. across. China. Var. **variegatum** has green and white lvs. often tinged red, said to be hardier.—A light yellow-fld. form has been listed as *Rhynchospermum Mandaianum.* The same or a related plant is *T. asiaticum.*

TRACHYCARPUS. *Palmaceæ.* A half dozen monœcious (or polygamous) Asian fan-palms of small or intermediate stature, comprising some of the hardiest kinds planted in the U. S., unarmed except perhaps on the petioles, with shaggy often fiber-bearing trunks: spadices several or many, shortly branched, among the lvs. and shorter than they; fls. solitary or in 2's: fr. of 3 more or less united dry small angled carpels, but sometimes 1 or 2 of the carpels fail to mature. These palms are still often called Chamærops, a practice that should be discontinued; from Chamærops the genus Trachycarpus is distinguished by valvate rather than imbricate perianth-lobes, the small dry 3-parted or 2-parted or at least carpel-like fr., and homogeneous rather than ruminate albumen of the seed, the small callous points or teeth on the petioles rather than long sharp spines. For cult. see *Palm.*

cæspitosus. Differs from other species in the few or several trunks arising from the same base, the trunks to 15 ft. and leafy throughout or bearing remains of old lvs. and also much fibrous material: lvs. 1½–2½ ft. across, cleft two-thirds or nearly to the base into narrow stiffish segms.; petiole slender, equalling or exceeding the blade, finely irregularly sharp-serrate on the edges particularly near the base: fls. very small and in technical structure differing from other species: fr. almost as in *T. Fortunei,* and slightly hairy under a lens. First described from plants growing in S. Calif.; supposed to be native in Japan.

excelsus of hort.: *T. Fortunei.*

Fortunei (*T. excelsus,* Hort. *Chamærops excelsa*). Windmill Palm. Trunk solitary and slender, to 10–30 or 40 ft., conspicuously covered with dark hair-like fiber, the old lvs. persistent and eventually hanging and sometimes developing a "petticoat" or shag like a Washingtonia: lvs. nearly or quite orbicular, 2–4 ft. across, dull and sometimes lightly glaucous, variously divided to middle or almost to base into stiffish horizontal or drooping segms.; petiole long, with irregular fine hard serratures or callous points: fr. globose-reniform, 3-lobed, or irregular from the abortion of 1 or more of the 3 carpels, bluish, size of pea or bean; seed umbilicate. Cent. and E. China, perhaps also Japan.—The commonly planted Trachycarpus of this country, standing as far north as N. C., and on west coast to Ore.

khasianus: *T. Martianus.*

Martianus (*T. khasianus*). Trunk slender, mostly naked and ringed with scars, bearing a hemispherical head, the old lvs. shedding: lvs. nearly orbicular and regularly circular with many segms. extending uniformly to the middle: fr. olive-form, ½ in. or less long; seed deeply sulcate or furrowed. Cent. and E. Himalayas, Assam, N. Burma.

nepalensis: *T. Wagnerianus.*

Takil. Robust, trunk ascending from an inclined or oblique base, clothed with lf.-sheaths but lacking hair-like fiber, the old lvs. shrivelling-persistent: lvs. nearly orbicular, irregularly parted (to different depths) into about 50 short-bifid segms.: fr. reniform, ½ in. or less long; seed umbilicate. W. Himalayas (Mt. Takil, etc.).

Wagnerianus (*T. nepalensis*). Mostly low, with erect solitary trunk covered with rough fibers: lvs. orbicular-ovate, irregularly parted to half or nearly to the base into many very stiff outstanding segms. that are entire or shortly bifid at apex; petiole very slender; with many irregular callous teeth toward base: fr. much as in *T. excelsus*. Species founded on cult. plants; probably Japanese.

TRACHYMENE. *Umbelliferæ.* Herbs with mostly ternately compound lvs., white or blue fls. in simple umbels, and compressed frs.

A few kinds are grown for ornament. For summer bloom seeds should be sown in spring where plants are to stand. Seeds may be sown in autumn under glass for spring bloom.

cærulea (*Didiscus cærulea*). Blue Lace-Flower. Ann. to 2 ft.: lvs. 1–2-ternately compound into narrow lobes: fls. blue, the long-stalked umbels to 3 in. across. Australia.

pilosa. Ann. to 6 in.: lvs. divided into linear lobes: fls. in small short-stalked umbels. Australia.

TRACHYSTEMON (*Psilostemon*). *Boraginaceæ.* Two per. herbs of the Medit. region of which one is rarely cult. for ornament. **T. orientale** (*Borago orientale*). Hairy: basal lvs. cordate, long-stalked, st.-lvs. ovate-lanceolate: fls. bluish-purple, with tube and 5 revolute lobes, borne in many-fld. panicles, the stamens long-exserted.—Propagated by seeds and division.

TRACYANTHUS: *Zygadenus angustifolius.*

TRADESCANTIA. Spiderwort. *Commelinaceæ.* American per. herbs with blue, rose-purple or white fls. in umbels or rarely solitary.

Spiderworts are grown under glass, in baskets, and in the open. Of easy culture. Propagated by cuttings of the growing shoots, seeds and division.

aureo-striata: hort. name for a plant with yellow-striped lvs.

bengalensis: hort. name for a plant with red fleshy lvs. and blue fls.

bracteata. To 1 ft.: lvs. linear or linear-lanceolate, to 8 in. long: fls. blue or reddish, with 2 involucral bracts broader than lvs. Minn. to Mo. and Tex.

discolor: *Rhœo discolor.*

dracænoides. To 2 ft., the roots tuberous: lvs. to 6 in. long and 1¼ in. wide, ciliate: fls. rose. Mex.—Some of the material cult. under this name is *Spironema fragrans.*

fluminensis (*T. striata*). Wandering Jew. Prostrate, sts. rooting: lvs. ovate, to 2½ in. long: fls. white. S. Amer.; nat. in S. U. S.—Common under benches in greenhouses. Lvs. normally lively green but they are striped with yellow and white in var. **variegata**; also yellow-lvd. sports.

fuscata. Stemless: lvs. to 8 in. long and 2 in. wide, brown-tomentose: fls. blue or bluish-purple. S. Amer.

geniculata (*T. hypophæa*). Sts. procumbent: lvs. to 5 in. long and 2 in. wide: fls. white. Trop. Amer.

humilis. To 1 ft., rough-pubescent: lvs. oblong-linear, short: fls. pale blue or pink. E. Tex.

hypophæa: *T. geniculata.*

lækenensis: hort. name for a plant with pink and green lvs.

lanceolata: hort. name for a plant with large downy lvs.

micrantha. Small creeper, or prostrate, with narrow lvs. 1½ in. or less long, and many small rose-purple fls. Tex. and adjacent Mex., sometimes in greenhouses and gardens in the region.

multicolor: *Zebrina pendula* var. *quadricolor.*

pilosa. To 3 ft., with zigzag sts., short-hairy: lvs. to 15 in. long and 2 in. wide: fls. lilac-blue. S. Pa. to Fla. and Mo.

quadricolor: *Zebrina pendula* var.

reflexa. To 3 ft.: lvs. linear, to 1½ ft. long, glaucous: fls. blue or white. Ohio to Fla. and Tex.; cult. in the open.

Reginæ. Lvs. lanceolate, to 6 in. long, purplish-crimson in center, silvery toward edge, purple beneath. Peru.

striata: *T. fluminensis.*

thuringia: hort. name for a plant with green and white lvs.

versicolor: *Rhœo discolor.*

virginiana. Common S. To 3 ft.: lvs. to 15 in. long and 1 in. wide: fls. violet-purple. N. Y. to S. D. and Ark.; an outdoor garden plant. Var. **alba** has white fls. and **coccinea** bright red. Var. **major** has double fls.

vittata: hort. name of doubtful application.

zebrina: *Zebrina pendula.*

TRAGOPOGON. Goats-Beard. *Compositæ.* Biennials and perennials with a tap-root, narrow grass-like lvs., and large yellow or purple heads of ligulate fls.; seed or fr. long and stick-like; pappus of plumose bristles; native in S. Eu., N. Afr. and Asia.

The first species is cultivated for the edible root. The seeds are sown in spring where plants are to stand. They should be thinned to 3–6 inches apart in the row. The roots may remain in the ground all winter. The plant blooms and seeds the following year.

porrifolius. Salsify. Vegetable-Oyster. Oyster-Plant. Hardy bien. to 4 ft., with roots to 1 ft. long: heads purple, to 4 in. across, exceeded by involucral bracts, opening in morning, closing by noon. S. Eu.; nat. in N. Amer.

pratensis. Hardy bien. to 3 ft.: heads yellow, to 2½ in. across. rays longer than involucral bracts. Eu.; nat. in N. Amer.—Seldom grown for ornament.

TRAJANS-COLUMN: *Pachycereus Columna-Trajani.*

TRAPA. Water-Chestnut. *Onagraceæ* (or *Trapaceæ*). Aquatic herbs with the submerged lvs. opposite and pinnatifid and the floating lvs. clustered, rhombic-orbicular and toothed, the petioles inflated, small white fls. borne among the lvs., and leathery or bony indehiscent nut-like frs. with prominent horns; grown in ponds and aquaria and also yielding edible frs. Propagated by seeds which must be kept moist.

bispinosa. Singhara-Nut. Petioles and under sides of lvs. hairy: fr.-body ¾ in. across, with usually 2 horns. Ceylon.

natans. Petioles and lvs. glabrous except veins beneath: fr. to 2 in. across, 4-horned. Eu., Asia; nat. in E. U. S.

TRAUTVETTERIA. *Ranunculaceæ.* Per. herbs with broad palmately lobed lvs. and small white fls. in panicles, having 3–5 caducous sepals, no petals and numerous stamens; native in N. Amer. and Asia, the species variously interpreted. Propagated by division of roots; wild border.

carolinensis (*T. palmata*). To 3 ft.: lvs. to 8 in. across, with 5–11 toothed lobes: fls. about ½ in. across. Pa. to Fla. and Mo.

palmata: *T. carolinensis.*

TRAVELERS-JOY: *Clematis Vitalba.* -Tree: *Ravenala madagascariensis.*

TREE: a woody plant that produces one main trunk and a more or less distinct and elevated head. -of-Heaven: *Ailanthus altissima.* -of-Sadness: *Nyctanthes Arbor-tristis.*

TREFOIL: *Lotus.* Tick: *Desmodium.*

TREMA. *Ulmaceæ.* Trees and shrubs with alternate toothed lvs. 3-nerved from base, small unisexual fls. in axillary clusters, and drupaceous frs.; native in trop. and warm regions of both hemispheres.

bracteolata. To 20 ft.: lvs. to 5 in. long and 2 in. wide, pubescent or becoming glabrous: fr. black, about ¹/₁₂ in. across. Afr., Arabia.—Grown in S. Calif.

TREMANDRACEÆ. TREMANDRA FAMILY. Three genera of heath-like shrubs with small lvs., red or purple fls. solitary in the axils, having usually 4–5 sepals and petals, 8–10 stamens, superior 2-celled ovary, and fr. a caps. Tetratheca is occasionally cult.

TREVESIA. *Araliaceæ.* Trop. Asian shrubs or small trees with compound or lobed lvs. and fls. in panicled umbels; grown in the greenhouse with a moist atmosphere.

palmata (*Gastonia palmata*). To 20 ft.: lvs. palmately 5–9-lobed, to 1½ ft. across, on petioles 1 ft. or more long: fls. yellowish-white, 1 in. across. Himalayas.

Sanderi. Lvs. to 2 ft. across, digitately compound. Cochin-China.

TREVOA. *Rhamnaceæ.* Small much branched spiny trees native in S. Amer., with opposite 3-nerved lvs., fls. in axillary clusters, and small drupaceous frs.; one species cult. in S. Calif. for ornament.

trinervis. Spines about ½ in. long: lvs. to 1 in. long, toothed. Chile.

TRICALYSIA. *Rubiaceæ.* African shrubs with opposite lvs., small axillary fls. having funnelform 4–8-lobed corolla, and fr. leathery and berry-like; one species sometimes cult. in S. Calif., with the look of Pentas.

floribunda: *T. Kraussiana.*

Kraussiana (*T. floribunda. Kraussia floribunda*). Lvs. ovate-oblong or lanceolate, to 3 in. long: fls. white, ¼ in. long: fr. ¼ in. across. Natal.

TRICHILIA. *Meliaceæ.* Trees and shrubs of trop. Amer. and Afr.: lvs. ternate or odd-pinnate, alternate: fls. not showy, in panicles, the calyx 4–5-lobed and petals 4–5: fr. a dry mostly leathery caps. of 2 or 3 cells, opening and exposing the seeds.

spondioides. To 20 ft.: lvs. pinnate; lfts. 6–20, opposite, ovate-oblong and pointed, entire, 1½ in. or more long: fr. more or less rugose, about ½ in. diam., seeds yellowish. Trop. Amer.—Planted in S. Fla. for ornament.

TRICHOCEREUS. *Cactaceæ.* Columnar more or less branched S. American cacti, erect or procumbent, about a score, with ribs few to many and commonly very spiny: fls. nocturnal, funnelform. Plants formerly named in Cereus. See *Cacti.*

Bridgesii (*Cereus Bridgesii*). To 15 ft., more or less branching, somewhat glaucous, ribs 4–8 and obtuse, spines yellowish and 2–4 in. long: fls. 2 in. and more long, probably white or whitish. Bolivia.

candicans (*Cereus candicans*). Making large clumps to 10 ft. across, joints erect or spreading to 2 ft., ribs 9–11, spines awl-like, the radials 10 or more, centrals several and to 4 in. long: fls. white, fragrant, to 6 in. long. Argentina.

chiloensis (*Cereus chiloensis*). Commonly with erect right-angled branches, to 25 ft., columnar, ribs 16 or 17 and divided into tubercles, radials 8–12, central 1: fls. white, tinged red outside, 5 in. or more long. Chile.

lamprochlorus (*Cereus lamprochlorus*). Columnar, single, or branched at base, to 6 ft. high and 3 in. thick, ribs 10–17, radials 11–14, centrals 4: fls. white, red outside, 8 in. or more long. Argentina.

macrogonus (*Cereus macrogonus*). Tall, bluish-green, rather slender, ribs commonly 7, spines needle-like and brown and several from an areole: fls. white. S. Amer.

pasacana (*Cereus pasacana*). To 30 ft. and more, columnar, simple or sparingly branched, ribs 20–38 and low, spines yellow and to 5 or 6 in. long: fls. 4 in. long, white. Bolivia, Argentina.

Spachianus (*Cereus Spachianus*). Upright, eventually branching at base, branches parallel with main st., to 3 ft. high, ribs 10–15, radials 8–10, central 1: fls. white, about 8 in. long. W. Argentina.

thelegonus (*Cereus thelegonus*). Procumbent or with erect branches, sts. to 3½ ft. long and cylindric and to 3 in. diam., ribs 12 or 13, divided into 6-sided tubercles, radials 6–8, central 1: fls. white, about 8 in. long.

TRICHODIADEMA. *Aizoaceæ.* Formerly included in Mesembryanthemum (which see): shrub-like small plants, with somewhat cylindric lvs. that are barbed at end and with surface cells slightly prominent and elongated: fls. solitary, short-stalked, medium size or small; stigmas 5–8. **T. barbatum** (*M. barbatum*), 3 or 4 in. high, somewhat woody, branches to 1½ ft. long, decumbent and tortuous: lvs. scattered, nearly cylindric, ½ in. long: fls. reddish, axillary and terminal, petals much exceeding calyx. S. Afr.

TRICHOLÆNA. *Gramineæ.* Mostly per. grasses with silky-hairy spikelets on slender stalks forming panicles; native in warm parts of Old World and one grown in the S. for forage and ornament, and nat. See *Grasses.*

rosea (*T. violacea. Panicum tonsum*). NATAL-GRASS. RUBY-GRASS. To 4 ft., grown as ann.: lvs. to 8 in. long and ¼ in. wide: panicles to 10 in. long, open, pink or reddish-brown, attractive, shining. S. Afr.

violacea: *T. rosea.*

TRICHOPILIA. *Orchidaceæ.* Trop. American epiphytes with 1-lvd. pseudobulbs and fls. on nodding scapes, the sepals and petals similar, the lip entire and overlapping around the column; grown in a temperate greenhouse. See *Orchids* for cult.

coccinea: *T. marginata.*

crispa. Lvs. to 6 in. long and 2 in. wide: fls. brownish-yellow, 2½ in. long, lip deep crimson margined with white, May–June. Costa Rica.

Galeottiana. Lvs. to 6 in. long and 2 in. wide: fls. with greenish-yellow sepals and petals and white wavy lip with yellow throat spotted with brown, in 1–3-fld. infl., June–July. Mex.

gigantea: a listed name.

marginata (*T. coccinea*). Lvs. broad-lanceolate: fls. whitish outside, reddish-purple inside, sepals and petals margined white, lip wavy. Costa Rica, Panama.

suavis. Lvs. to 8 in. long and 2½ in. wide: fls. fragrant, white or creamy spotted with rose and with yellow throat, wavy, in 2–3-fld. infl., Mar.–May. Cent. Amer.

tortilis. Lvs. to 6 in. long and 1½ in. wide: fls. 1 or 2; sepals and petals twisted, brown edged with greenish-yellow; lip white spotted inside with red-brown, Dec.–Feb. Guatemala, Mex.

TRICHOSANTHES. *Cucurbitaceæ.* Ann. and per. monœcious or diœcious herbs with branched tendrils, of trop. Asia and Australia and Polynesia, one much grown in some countries: fls. white, pistillate usually solitary and staminate usually racemose: fr. fleshy, indehiscent, of various shapes.

Anguina (*T. colubrina*). Serpent, Snake or Club Gourd. Climbing or long-running monœcious ann.: lvs. broad-ovate to triangular-ovate, to 9 in. long, sometimes shallowly 3-lobed: fls. deeply and finely laciniate, the staminate long-stalked: fr. 1–6 ft. long and very slender, mostly curved or coiled unless hanging from a support. India, and there grown for the edible fr., with us as a curiosity.

colubrina: *T. Anguina.*

TRICHOSMA SUAVIS: *Eria coronaria.*

TRICHOSPORUM (*Æschynanthus*). *Gesneriaceæ.* Woody climbers with mostly opposite lvs., 2-lipped tubular fls. solitary or in clusters, and linear capsular frs.; native in trop. Asia.

These plants should be grown in pans or baskets hung to the rafters of a warm greenhouse. They require loose open soil with fibrous material. Propagated by stem-cuttings about 2 inches long having two leaves and another joint.

Boschianum. Lvs. ovate or oval, entire: fls. scarlet, 2 in. long, pubescent, twice as long as calyx. Sumatra.

Lobbianum. Lvs. ovate, nearly entire: fls. scarlet with yellow throat, pubescent, twice as long as purple calyx. Java.

marmoratum (*Æ. zebrina*). Lvs. oblong-lanceolate to ovate, to 3½ in. long, reddish-purple beneath: fls. green spotted with brown, ciliate. Habitat unknown.

pulchrum. Lvs. broad-ovate, toothed: fls. scarlet with yellow throat, glabrous, three times as long as calyx. Java.

TRICHOSTEMA. Blue-Curls. *Labiatæ.* N. American herbs with entire lvs. and blue or purple fls. in axillary cymes or racemes; sometimes planted in the wild- or rock-garden.

lanatum. Per. to 4 ft., shrubby at base: lvs. linear-lanceolate, to 2 in. long, revolute, tomentose beneath: fls. ½ in. long, densely covered with blue or purple wool. S. Calif.

TRICUSPIDARIA: *Crinodendron.*

TRICYRTIS (*Compsoa*). Toad-Lily. *Liliaceæ.* E. Asian per. herbs with short or sometimes creeping rootstocks, alternate sessile or clasping lvs. and bell-shaped spotted fls., the perianth-segms. distinct; grown in pots or partially hardy out-of-doors in the N. Propagated by division.

hirta. To 3 ft., hairy all over: lvs. ovate, to 6 in. long: fls. whitish spotted inside with purple and black, 1 in. long, several together in axils. Japan.

macropoda. To 3 ft.: lvs. oblong, to 5 in. long, slightly pubescent beneath: fls. pale purple minutely spotted with purple, ¾ in. long, in terminal corymbs. China, Japan. Var. **striata** has lvs. striped green and white.

TRIDAX. *Compositæ.* Trop. American herbs with opposite lvs. and long-stalked heads of white, pink or yellow ray-fls. and yellow disk-fls.; pappus of scales or awns. Occasionally grown in the flower-garden.

trilobata. Ann. to 1 ft.: lvs. 3-lobed or toothed: heads yellow, about 1 in. across. Mex.

TRIENTALIS. Starflower. *Primulaceæ.* Per. herbs of the northern hemisphere, sometimes grown in the wild-garden: lvs. mostly clustered at top of st.: fls. white or pink, wheel-shaped, 1–3 on slender pedicels.

americana: *T. borealis.*

borealis (*T. americana*). To 9 in.: lvs. in a whorl of 5–10, lanceolate, to 4 in. long: fls. ½ in. across, on stalks to 2 in. long. Lab. to Va. and Ill.

europæa. To 8 in.: lvs. scattered, obovate, to 2½ in. long: fls. to ¾ in. across. Eu., Asia.

TRIFOLIUM. Clover. *Leguminosæ.* Herbs with mostly digitate lvs. of 3 lfts., small papilionaceous fls. in dense heads or spikes, and small pods usually inclosed by the calyx; fls. red, purple, pink, yellow, white.

The genus furnishes valuable forage and cover-crop plants in the species *T. alexandrinum, hybridum, incarnatum, medium, pratense, repens*; some kinds may be grown for ornament. Propagated by seed sown broadcast, in early spring. See *Clover.*

agrarium. Ann. to 1½ ft.: lfts. obovate or oblong: fls. yellow, in oblong heads. Eu.; nat. in E. U. S.

alexandrinum. Berseem. Egyptian C. Ann. to 2 ft.: lfts. oblong: fls. white or yellowish-white, in globular heads. Egypt, Syria.

alpestre. To 1 ft. or more: lvs. oblong-lanceolate: fls. purple, in globular heads. Eu., W. Asia.

alpinum. Per. to 4 in.: lfts. lanceolate: fls. red, rarely yellowish-white, in loose heads. Mts. of Eu.

arvense. Ann. to 1½ ft.: lfts. linear or oblanceolate: fls. whitish, in oblong heads. Eu., N. Asia; nat. in N. Amer.

filiforme. Diffuse ann. about 6 in. high: lfts. obovate: fls. yellow, in few-fld. heads. Eu.

hybridum. Alsike C. Per., with erect or lopping sts. to 2 ft. high: lfts. ovate: fls. pink, in globular heads. Eu.; nat. in U. S.

incarnatum. Crimson C. Ann. to 3 ft.: lfts. broadly obovate: fls. crimson, in oblong spike-like heads. Eu.; nat. in U. S.

medium. Zigzag C. Per. to 1 ft., with creeping rootstock, the sts. zigzag: lfts. elliptic to oblong; stipules narrow at base and pointed: fls. deep purple, in globular heads; calyx glabrous outside. Eu.

minus: a form of *T. repens.*

montanum. Per. to 1½ ft.: lfts. linear-lanceolate: fls. white. Eu.

pratense. Red C. Per. to 2 ft. without rootstock: lfts. oval to obovate; stipules broad at base and awned: fls. rose-purple or rarely white, in globular heads; calyx hairy outside. Eu.; nat. in U. S. Var. **foliosum,** Orel C., is a very leafy race. Var. **perenne,** a more or less indefinite name for forms of *T. pratense.* Var. **serotinum,** Mammoth Red C., late-flowering robust race.

repens. White C. Per., sts. creeping to 1 ft.: lfts. obcordate: fls. white, in globular heads. Eu.; nat. in U.S.

resupinatum (*T. suaveolens*). Ann., trailing or diffuse: lfts. obovate: fls. purple, in globular heads. Greece to Persia.

rubens. Per. to 2 ft.: lfts. narrowly oblong: fls. purplish-red, in spike-like usually twin heads. Eu.

suaveolens: *T. resupinatum.*

TRIGONELLA. *Leguminosæ.* Herbs occasionally grown for forage or ornament, with trifoliolate lvs., papilionaceous fls., and beaked pods. Propagated by seeds.

cærulea (*Melilotus cærulea*). Ann. to 2 ft.: fls. blue and white, in long-stalked heads: pods short with long beak. Eu.

Fœnum-Græcum. FENUGREEK. Ann. to 2 ft.: fls. whitish, 1 or 2 together: pods long and slender with long beak, the seeds having medicinal value: employed in Medit. region for forage. S. Eu., Asia.

TRIGONIDIUM: *Lælia monophylla.*

TRILISA. *Compositæ.* Two erect per. alternate-lvd. herbs of E. N. Amer., sometimes transferred to grounds, separated from Liatris largely on the character of involucre and the corymbose or paniculate infl.

odoratissima (*Liatris odoratissima*). CAROLINA VANILLA. To 3 ft., with fibrous root: lvs. oblong to spatulate, entire or toothed, to 10 in. long: heads rose-purple, without rays, in autumn. N. C. to Fla. and La. —Herbage vanilla-scented when bruised.

paniculata (*Liatris paniculata*). Differing from the above chiefly in the sticky-pubescent sts.: fls. purple or white. Va. to Fla.

TRILLIUM. *Liliaceæ.* Attractive low per. herbs of woods, with short thick rootstocks and simple sts. bearing at the top 3 broad whorled lvs. and a solitary white, pink or purplish fl., the perianth-segms. distinct, the 3 outer green and persistent; planted in the wild-garden or border for the early spring bloom.

Trilliums require fertile moist soil in partial shade. Roots may be transplanted from the wild, preferably after flowering. Propagated also by seeds.

cernuum. To 1½ ft.: lvs. broadly rhombic-ovate, to 5 in. long, sessile: fls. white, 1 in. long, drooping on peduncles to 1¼ in. long. Newf. to Ga. and Mo.

erectum. To 1 ft. or more: lvs. broadly rhombic-ovate, to 7 in. long: fls. brown- or greenish-purple, 1 in. long, nearly erect on peduncles to 4 in. long. N. S. to N. C. and Tenn. Var. **album** has white fls.

erythrocarpum: *T. undulatum.*

grandiflorum. To 1½ ft.: lvs. broadly rhombic-ovate, to 6 in. long: fls. white fading to rosy-pink, to 3 in. long, erect on peduncles to 3 in. long. Que. to N. C. and Mo.

nivale. To 6 in.: lvs. ovate, to 2 in. long: fls. white, 1 in. long, erect or drooping on peduncles to 1 in. long. Pa. to Ky. and Neb.

ovatum. To 1½ ft.: lvs. rhombic-ovate, to 6 in. long: fls. white fading to rose, 2 in. long, erect on peduncles to 3 in. long. B. C. to Calif.

petiolatum. To 6 in., the st. scarcely rising above the ground: fls. purple, to 2 in. long, sessile. Ida., Ore.

pusillum. To 8 in.: lvs. oblong or lanceolate: fls. pink, 1 in. long, erect on peduncles ½ in. long. N. C., S. C.

recurvatum. To 1½ ft.: lvs. ovate to oblong: fls. brown-purple, 1 in. long, erect, sessile. Ohio to Miss. and Ark.

rivale. To 8 in.: lvs. ovate-lanceolate: fls. white marked with purple, to 1 in. long, erect on peduncles to 1½ in. long. Ore., Calif.

sessile. To 1 ft.: lvs. ovate: fls. purple or green, 2 in. long, erect, sessile. Pa. to Fla. and Miss. Var. **californicum** has spotted lvs. and purple, rose or white fls. to 4 in. long. Calif., Ore. Var. **rubrum** has red-purple fls.

stylosum. To 1½ ft.: lvs. oval: fls. pink or rose, to 2½ in. long, drooping on pedicels to 2 in. long. N. C. to Ga. and Ala.

undulatum (*T. erythrocarpum*). To 2 ft.: lvs. ovate: fls. white veined purple, 1½ in. long, erect or somewhat drooping on peduncles to 2½ in. long. N. S. to Ga. and Mo.

TRIMEZA (*Trimezia*). *Iridaceæ.* Bulbous herbs of trop. Amer., one intro. in S. Calif.: perianth-segms. distinct, the 3 inner much smaller than the 3 outer.

martinicensis (*Cipura martinicensis*). To 2 ft.: lvs. linear-lanceolate: fls. in terminal clusters, yellow with brown at base, ¾ in. long. W. Indies, S. Amer.

TRIOSTEUM. HORSE GENTIAN. FEVERWORT. *Caprifoliaceæ.* Per. herbs of weedy habit sometimes transferred to grounds: lvs. opposite, entire, sessile: fls. yellowish or purplish, gamopetalous, solitary or clustered in the axils, not showy: fr. a leathery drupe.

aurantiacum. To 4 ft.: lvs. ovate to oblong-lanceolate, to 10 in. long: fls. dull red, ¾ in. long: fr. orange-red. N. B. to N. C. and Mo.

perfoliatum. To 4 ft.: lvs. ovate or oval, to 9 in. long, often connate at base: fls. purplish, ¾ in. long: fr. orange-yellow. Mass. to Ky. and Kans.

TRIPHASIA. *Rutaceæ.* One spiny evergreen shrub or small tree grown far S. for ornament and hedges. T. trifolia (*T. aurantiola*). LIME-BERRY. To 15 ft.: lvs. nearly sessile, 3-foliolate, the lateral lfts. small, the terminal to 1½ in. long, all blunt or emarginate and more or less finely crenate: fls. white, fragrant, solitary in axils; stamens 6, not united: fr. a dull red berry ½ in. diam. Origin unknown; probably Malayan.—Propagated by seeds. *T. monophylla* is Severinia.

TRIPLARIS. *Polygonaceæ.* Trees or large shrubs, native in trop. Amer., diœcious: lvs. large, alternate, simple, on the ovate, oblong, lanceolate order: fls. relatively small, sessile or nearly so between bracts in a spicate or racemose infl.: fr. a 3-angled nut.

americana. Tree to 30 ft. or more, with hollow branches: lvs. oblong to elliptic, to 15 in. long, acuminate: fls. in great panicles, the pistillate ones red and showy: fr. falling with a spinning motion. Cent. Amer. —Known as hormigo and volador. Planted in S. Fla.

TRIPTERYGIUM. *Celastraceæ.* A few species of E. Asian deciduous shrubs with large alternate petioled lvs., polygamous small white fls. in terminal panicles, and fr. a 1-seeded 3-winged samara.

Regelii. To 6 ft. or more, the branches long and lithe: lvs. celastrus-like, wide-elliptic to ovate, blunt-serrate, to 6 in. long: panicles to 10 in. long: fr. nearly orbicular in outline and ¾ in. or more across. Manchuria to Japan; hardy N.

TRISETUM. FALSE OAT. *Gramineæ.* Per. tufted grasses resembling oats and one species sometimes planted for ornament: lvs. flat: spikelets borne in panicles, the florets awned: widely distributed in temp. regions. See *Grasses.*

flavescens (*Avena flavescens*). To 2½ ft.: lvs. to 5 in. long and ¼ in. wide: panicles to 5 in. long, yellow turning brown, florets with long twisted awns. Eu., Asia; nat. in Mo. and Kans.

TRISTANIA. *Myrtaceæ.* Trees and shrubs native in Malaya and Australia with simple lvs. alternate or whorled at ends of branchlets, small yellow or white fls. in axillary cymes, and capsular fr.; grown out-of-doors in warm regions. Propagated by seeds or half-ripened cuttings under glass.

conferta. BRISBANE BOX. To 150 ft.: lvs. ovate-lanceolate, to 6 in. long: fls. white, ¾ in. across: fr. ½ in. across. Australia.

laurina. Small tree or shrub: lvs. lanceolate or elliptic, to 4 in. long: fls. yellow, ⅙ in. long: fr. ¼ in. across. Australia.

TRITELEIA: *Brodiæa.*

TRITERNATE: three times three; the leaflets or segments of a twice ternate leaf again divided in three parts.

TRITHRINAX. *Palmaceæ.* Five species of low or middle-sized hermaphrodite fan-palms of trop. and S. Brazil, Bolivia, Paraguay, Argentina, often cespitose, characterized by very strong long spines terminating the stiff network of the old lf.-sheaths on the trunk: lvs. more or less orbicular in outline, firm, cut into many deep segms.; the petiole unarmed, except perhaps a few hard fibers at the base: spadix among the lvs., branched, the fls. solitary and sessile; stamens 6: fr. globose, 1 in. or less diam., the perianth somewhat enlarged but not prominent; seed 1. The Trithrinaxes are somewhat planted in the open in S. Calif. and probably elsewhere as single specimens, interesting for their good habit and vicious spines. See *Palm.*

acanthocoma. Trunk single and several ft. high, densely clothed with deflexed slender but stiff spines 3–6 in. long from the network base: lvs. to 3 ft. across, green both sides but lighter underneath, deeply cleft into some 40 finely striate segms. which are bifid for an in. or two at apex and which droop on the lower lvs.: fr. about ¾ in. thick, with short stigmatic point not centered. S. Brazil.

brasiliensis. Trunk single, to 12 ft. or more, clothed with spines much as in the above species: lvs. to 3 ft., stiff, divided to about the middle, and the 30 or so segms. not or scarcely drooping, green above and glaucescent underneath, the finely striate segms. bifid at the end 5–8 in. deep. S. Brazil to Paraguay.

campestris. Trunk to 10 or 12 ft. but in cult. often long remaining a mass of sword-like points with st. covered in foliage, the sharp spines very stiff and strong and often above 6 in. long: lvs. 2–3 ft. across, gray-green, divided nearly to base into 20 or more rigid spine-tipped segms. that are bifid 5–8 in.: fr. nearly 1 in. across, with a flexible exterior. Argentina.

TRITICUM. *Gramineæ.* Tall ann. or bien. grasses with flat lvs. and spikelets borne in terminal close spikes; native in Medit. region and W. Asia, and one grown for the grain which is the principal source of bread flour. See *Grasses.*

æstivum. WHEAT. Ann. to 4 ft.: lvs. to 15 in. long and ½ in. wide: spikes to 4 in. long, awned or awnless: grains ¼ in. long, grooved. Cultigen; winter and spring wheat. Var. **dicoccum**, EMMER, has dense awned or bearded spikes. Var. **monococcum**, EINKORN, has flattened long-awned spikelets in slender spikes. Var. **polonicum**, POLISH W., has papery glumes as long as spikelets. Var. **Spelta**, SPELT, has awned rather 4-sided slender spikes.

TRITOMA: *Kniphofia.*

TRITONIA (*Montbretia*). *Iridaceæ.* S. African cormous herbs having narrow lvs. toward base of st. and yellow, orange, red or white fls. in simple or panicled spikes on sts. to 3 ft. high, the perianth with long or short tube.

Culture as for gladiolus; hardy in the North, and may be left permanently or replanted each year from corms well ripened and stored after the blooming period; plant 3 or 4 inches deep and 3–6 inches or more apart.

crocata. Fls. tawny-yellow or orange-red, 2 in. across.

crocosmæflora. Fls. orange-crimson, to 2 in. across, with tube shorter or longer than segms. Hybrid of *T. Pottsii* and *Crocosmia aurea.* Var. **aurantiaca** has deep orange fls.

Pottsii. Fls. bright yellow-red, 1 in. long, the tube twice longer than segms.

rosea. Fls. bright red spotted yellow at base, 1 in. long, the tube as long as segms.

TROCHODENDRACEÆ. TROCHODENDRON FAMILY. Two genera from E. Asia, trees or shrubs with alternate toothed lvs. without stipules, bisexual fls. without perianth, carpels 5 or more, and fr. a samara or follicle. The family is closely associated with Cercidiphyllaceæ, and once included in the Magnoliaceæ. Euptelea and Trochodendron are grown for ornament.

TROCHODENDRON. *Trochodendraceæ.* One Japanese and Korean evergreen tree sometimes planted in S. U. S. **T. aralioides.** To 60 ft.: lvs. obovate to lanceolate, to 6 in. long, wavy-toothed, long-stalked, shining above: fls. bright green, ½ in. across, in racemes to 3 in. long: fr. brown, ½ in. across.

TROLLIUS. *Ranunculaceæ.* Per. herbs native in the north temp. zone mostly in swampy or low places, with thick fibrous roots, palmately lobed or divided lvs., usually solitary terminal fls. in spring and early summer, having 5–15 petal-like sepals, 5 or more small petals, and many stamens; spring.

Trollius requires moist soil. The species make attractive spring-flowering clumps, in yellow and orange; useful for borders. Propagated by seeds or division.

albiflorus. To 1 ft.: fls. white, to 1½ in. across, with 5–7 spreading sepals, the petals shorter than sepals and stamens. B. C. to Colo.

asiaticus (*T. giganteus*). To 2 ft. or more: fls. orange, with 10 spreading sepals, the petals longer than stamens but shorter than sepals. Siberia.

caucasicus. To 3 ft.: fls. yellow, with 5–8 spreading sepals, the 10 petals about length of stamens and shorter than sepals. W. Asia.

chinensis (*T. sinensis*). Tall: fls. yellow, with 12–13 spreading sepals, the 20 petals longer than stamens and sepals. N. China.

europæus. GLOBE-FLOWER. To 2 ft.: fls. lemon-yellow, to 2 in. across, globular, with 10–15 incurved sepals, the petals about length of stamens and shorter than sepals. Eu. Var. **Loddigesii** has deep yellow fls.

Fortunei: listed name, probably *T. japonicus.*

giganteus: *T. asiaticus.*

japonicus. To 8 in.: fls. yellow, with 5–6 spreading sepals, the petals longer than stamens. Japan. Var. **flore-pleno** has double fls.

laxus. To 2 ft., the sts. weak: fls. yellowish-green, to 2 in. across, with 5–7 spreading sepals, the 15–25 petals much shorter than stamens E. U. S., in bogs and swamps.

Ledebouri. To 2 ft.: fls. yellow, with 5 spreading sepals, the 10–12 petals longer than stamens but shorter than sepals. Siberia.

patulus. To 1 ft.: fls. golden-yellow, with 5–7 spreading sepals, the 1–5 petals about length of stamens and shorter than sepals. W. Asia.

pumilus. To 1 ft.: fls. yellow, 1 in. across, with 5–6 spreading sepals, the 10–12 petals about length of stamens but shorter than sepals. Himalayas. Var. **yunnanensis** is taller, with 6–8 sepals and petals shorter than stamens. W. China.

sinensis: *T. chinensis.*

TROPÆOLUM. NASTURTIUM. The only genus of *Tropæolaceæ.* Quick-growing herbs, often climbing by means of coiling petioles, sometimes with tuberous roots, having alternate lvs., showy mostly yellow, orange or red irregular fls. solitary on long axillary sts., one sepal produced into a slender nectar-spur, and fr. of 3 1-seeded carpels; native Mex. to Chile.

Nasturtiums are grown as annuals in warm sunny situations. Seed may be sown where plants are to stand or in early spring in boxes and pots and transplanted in May. They are useful for cut-flowers and the abundant foliage covers rocks and brushy places acceptably. The plants are frost-tender. The flower-buds and young seeds are sometimes picked and used as seasoning, under the name Indian cress.

canariense: *T. peregrinum.*

Lobbianum: *T. peltophorum.*

majus. Garden N. Climbing: lvs. round or somewhat kidney-shaped, peltate, on long petioles: fls. to 2½ in. across, of various colors, usually with a yellow or orange background striped and spotted with red and brown. S. Amer. Var. **nanum.** Tom Thumb N. A dwarf strain. Some of the named color forms are: **atropurpureum,** dark red; **coccineum,** scarlet; **Heinemannii,** chocolate; **hemisphericum,** light yellow; **luteum,** yellow; **Regelianum,** purple-violet; **Scheuerianum,** straw-colored.

minus. Dwarf, not climbing but more or less scrambling, smaller than *T. majus:* fls. 1½ in. or less across. S. Amer.

peltophorum (*T. Lobbianum*). Climbing, hairy: lvs. round, peltate: fls. 1 in. long, orange-red. S. Amer.

pentaphyllum. Climbing, with tuberous root: lvs. divided into 5 lfts.: fls. 1½ in. long, with large red spur. Argentina.

peregrinum (*T. canariense*). Canary-Bird-Flower. Climbing: lvs. deeply 5-lobed, peltate: fls. to 1 in. across, canary-yellow with green curved spur. Probably Peru and Ecuador.

polyphyllum. Per., prostrate or climbing: lvs. peltate, orbicular, deeply divided into 7–9 narrow segms.: fls. yellow streaked with red, smaller than *T. majus.* Chile.

speciosum. Per., climbing: lvs. divided into 6 lfts.: fls. to 1½ in. long, vermilion-red. Chile.

tricolor. Per., climbing, with fleshy root: lvs. divided into 6 lfts.: fls. 1 in. long, with vermilion spur, purplish lobes and yellow petals. Chile.

tuberosum. Climbing, with large underground tubers: lvs. 5-lobed, peltate: fls. to ¾ in. long, with long red spur and yellow petals. W. S. Amer., where the tubers are prepared for eating.

TRUMPET-CREEPER: *Campsis.* -Flower: *Bignonia capreolata.* -Vine: *Campsis radicans.*

TRUNCATE: appearing as if cut off at the end; the base or apex nearly or quite straight across.

TSUGA. Hemlock. Hemlock-Spruce. *Pinaceæ.* Tall evergreen trees with slender horizontal branches, linear usually flattened lvs. with 2 white bands beneath, and small cones having woody persistent scales; native in N. Amer. and Asia.

Hemlocks are valuable lawn trees, particularly as young specimens; they are best when not too much exposed to winter winds and winter sun. *T. canadensis* is the hardiest, but most of the others stand in climates like that of central New England. For cultivation see *Conifers.*

canadensis (*Abies canadensis*). Lvs. finely toothed, obtuse or acutish: cones to ¾ in. long, stalked. N. S. to Ala. Hort. vars. are: **albo-spica,** tips of young branchlets white; **compacta,** dwarf conical form; **gracilis,** branches drooping at ends, lvs. very small; **microphylla** (var. *parvifolia*), lvs. ¼ in. or less long; **nana,** dwarf form; **pendula** (var. *Sargentii pendula*), branches drooping, forming a dense broad bush.

caroliniana (*Abies caroliniana*). Lvs entire, obtuse or slightly notched at apex, glossy dark green above: cones to 1½ in. long. Mts. of Va. to Ga. Var. **compacta** is a denser round-topped form.

chinensis. Lvs. entire, notched at apex, glossy dark green above, the bands beneath inconspicuous: cones to 1 in. long. W. China.

diversifolia. Japanese H. Branches reddish-brown: lvs. entire, obtuse or notched: cones to ¾ in. long. Japan.

dumosa. Lvs. finely toothed, acute: cones 1 in. long. Himalayas.—To be planted far S.

heterophylla. Western H. Lvs. finely toothed, obtuse or acutish: cones to 1 in. long. Alaska to Calif.

Jeffreyi. Hybrid between *T. Mertensiana* and *T. heterophylla.*

Mertensiana. Mountain H. Lvs. rounded or keeled, bluish-green, acutish: cones to 3 in. long. Alaska to Calif. Var. **argentea** has bluish-white lvs.

Sieboldii. Branchlets glabrous: lvs. entire, notched at apex: cones to 1¼ in. long. Japan.

yunnanensis. Lvs. entire, obtuse: cones to 1 in. long. W. China.

TUBEFLOWER: *Siphonanthus indica.*

TUBER: a short congested part; usually defined as subterranean (as of a rootstock), although this is not essential.

TUBERCLE: a small tuber, or rounded protruding body.

TUBEROSE: *Polianthes tuberosa.*

TULIP: *Tulipa.* Globe-: *Calochortus.* Star-: *Calochortus monophyllus.* -Tree: *Liriodendron.*

TULIPA. Tulip. *Liliaceæ.* Popular hardy spring-blooming bulbs planted out-of-doors and forced in the greenhouse, having basal and st.-lvs. and bell-shaped or saucer-shaped mostly erect fls. which are commonly solitary but sometimes 2–5 at top of st., the perianth-segms. distinct.

The common garden tulips are all supposed to be of the species *Tulipa Gesneriana,* native in Russia and Asia. The very early tulips of the Duc Van Thol kind are *T. suaveolens,* of southwestern Asia and the Caspian region. The dragon or parrot tulips are fringed and crisped forms of the common tulip, *T. Gesneriana* var. *Dracontia.* The Darwin tulips are a tall late-flowering robust race with clear colors, *T. Gesneriana* var. *Darwinia.* The Rembrandts are a subclass of Darwin tulips with variegated or particolored flowers. The cottage tulips are an early or mid-season class, in many colors; the term is usually applied to the common tulips that do not fall into other classes. The "breeder" tulips are strains with self or unbroken colors although the base of the segments may be varicolored; "broken" tulips have parti-colored segments throughout; "bybloems" have white under-color with markings of rose, lilac or purple; "bizarres" have yellow under-color and red or brownish or purplish overcolors. Tulips have wide range of color in all except true blues, as also of shape of blossom, of stature, and of season, allowing a wide choice to the planter. The bottom of the flower-cup inside is likely to have darker blotches, forming an "eye" when the flower is widely expanded. Special bulb catalogues are useful in making selections.

Other species than *T. Gesneriana* and *T. suaveolens* are more or less grown in borders or as curiosities, and they are likely to be catalogued as "botanical tulips." They are native from Europe to north Africa and Japan. Among them are choice and interesting ornamental subjects, some of them adapted to rock-gardens.

Tulips are planted in autumn as are other Holland bulbs, usually in October in the North. The soil should be deep, fertile and well drained. The bulbs may sit 4 to 6 inches below the surface (depending somewhat on size and soil) and 4 to 6 or 8 inches apart (conditioned on the size and variety). For uniform results in height and blooming season, see that the bulbs are graded to one size and are set in one kind of soil at the same depth; in making pattern beds, it is well to remove the earth, firm the under-soil, place the bulbs carefully, then cover with earth without disturbing them. Mulch freely for winter. After two or three years the tulip plot becomes crowded and it is well to take up the bulbs after the leaves have ripened and replace the best ones. For pattern beds, the bulbs are set each year. Tulips open fully in sunshine, but as the outside of the flower is colored and the cup is attractive in shape at any stage, the plants are serviceable at all hours.

Tulips force readily. Strong bulbs are placed in pots or boxes in autumn, set in a frame or other outdoor area and covered a few inches with mulch of leaves, litter or even light earth until the pots are well filled with roots which will be in four to six weeks. Five or six bulbs of the usual single forcing kinds may be placed in a 6-inch pot or pan, and six to eight in a 7-inch pot; the bulbs are covered to the tip. When well rooted, pots may be brought to a fairly warm building until growth is well started, when they may be placed in the conservatory or living-room; it is well to have a sufficient supply so that pots may be brought in every ten days or two weeks for succession. The best season for bloom is after the holidays till spring. Early tulips are sometimes bloomed in water glasses, for which see hyacinth, although they are not so popular as that flower for this method of culture. After blooming in the house, the bulbs are discarded, although they are sometimes transferred to the border and may recover after a year or two.

Propagation of tulips is usually effected by the natural increase of the bulbs by means of offsets or young bulbs; these planted by themselves produce a blooming bulb in one or two years. Expert propagators stimulate the formation of offsets by cutting the bulb. Seeds may be employed, if one desires to produce new kinds; two or three years are required.

acuminata (*T. cornuta. T. stenopetala*). TURKISH T. Medium height, 12–18 in.: lvs. rather narrow, undulate: fl. expanded, light yellow with red lines, segms. very long narrow-pointed. Probably Turkey.—Perhaps a form of the *T. Gesneriana* group. Midseason.

australis (*T. Celsiana*). Medium: lvs. channelled: fl. yellow, reddish outside, nodding in bud, segms. acute. France to Algeria.—Midseason.

Batalinii. Low, 5 or 6 in.: lvs. very narrow: fl. pale yellow, segms. obtuse or nearly so and sometimes cut near apex: lvs. very narrow. Bokhara.—Early.

biflora. Small plant with 2 or 3 very narrow lvs.: fls. 2, small, pale yellow or whitish inside tinged reddish or purplish outside, segms. acute. Asia.—Early to midseason. Var. **turkestanica.** Larger, lvs. broader: fls. often 4 or 5 to stem. Var. **major** is listed.

Billiettiana. Robust with broad lvs.: fl. bright yellow, flushed, segms. sharp. Italy.—Late.

carinata. Fl. dark red with lighter base, segms. acute: lvs. about as long as scape and somewhat undulate. Probably of hort. origin.—Midseason.

Celsiana: *T. australis.*

chrysantha. To 6 in.: lvs. glaucous and recurved, the upper ones very narrow: fl. medium, bright yellow, the outer segms. acuminate. Persia.—The name is also likely to be applied to a golden-fld. garden tulip.

Clusiana. Medium: bulb small and hairy: lvs. narrow: fl. small, white or yellowish with purple base, fragrant, segms. more or less acute. Portugal to Persia. —Midseason.

cornuta: *T. acuminata.*

dasystemon. Small and small-fld., 3–6 in. high: fls. usually several, yellow, segms. edged white and greenish on back, narrow: lvs. glaucous. Turkestan.

Didieri. Medium: lvs. undulate: fl. large, bright crimson with blotch in bottom, outer segms. reflexed. S. Eu.—Runs into several forms. Var. **Mauriana** has narrower and slightly undulate lvs: fls. brilliant red with yellow blotch.

Eichleri. Low, 6–10 or 12 in. with broad long-pointed lvs.: fl. large, deep scarlet with blue-black bottom, segms. obtuse but mucronate. S. W. Asia.

florentina: *T. sylvestris.*

Fosteriana. Robust: lvs. very broad: fls. very large, intense crimson and darker in bottom. Turkestan.

fulgens: *T. Gesneriana.*

Gesneriana (*T. fulgens*). COMMON T. Stout plant, to 18 or 24 in., and mostly broad ample lvs.: fl. white, red, yellow, often variously marked, segms. broad and obtuse but often with a mucro. Armenia, Persia.

Greigii. Low, 12 in. or less, with broad dark colored undulate lvs.: fl. orange-scarlet with dark yellow-margined blotch in bottom. the segms. broad, often cuspidate. Turkestan.—Early.

Hageri. Low, about 6 in., with narrow acute lvs.: fls. 1 or 2, usually red with darker bottom, segms. narrow and acute. Greece.—Early.

humilis. To 5 in. or less: lvs. 2 or 3, linear: fl. small, pale purple inside but yellowish in bottom, outside reddish-green, segms. narrow and acute. Persia.

ingens. Low, 12 in. or less, with broad hairy lvs.: fl. very large, vermillion with dark bottom, segms. obtuse but mucronate. Bokhara.—Early.

Kaufmanniana. Beautiful tulip usually 5–10 in. high with very broad short acuminate lvs.: fl. large and open, creamy-white or light yellow with yellow center and carmine marks, segms. obtuse. Turkestan.—Early.

Kolpakowskiana. Low, with narrow pointed lvs.: fl. yellow, often reddish or purple outside, segms. narrow and mostly acute. Turkestan.—Early.

linifolia. Low, 10 in. or less, with very narrow grass-like lvs.: fl. medium size, crimson with bluish bottom, segms. short-acute. Bokhara.—Early.

Marjoletti. Slender, 18–24 in., with narrow and acuminate lvs.: fl. yellowish with broad purple-margined short-acute segms. Savoy.—Midseason.

Mauriana: *T. Didieri* var.

montana. To 8 in.: lvs. long-pointed, glaucous: fls. deep crimson with paler outside, 2 in. across, outer segms. acute. Persia, Afghanistan.

Oculus-solis. Tall, with rather broad acute lvs.: fl. large, bright red with large black yellow-margined bottom, segms. acute. S. Eu.—Early.

Orphanidea. Low, slender, 12 in., the long narrow lvs. equalling or exceeding scape: fl. yellow and tinted, with narrow very acute segms. Greece.—Early.

patens (*T. persica*). Low, mostly 9 in. or less, with narrow often curved lvs.: fls. 1–3, whitish or yellowish with yellow bottom, fragrant, segms. narrow and obtuse or nearly so. Siberia.—Midseason.

persica: *T. patens.*

polychroma. Dwarf, with narrow acute lvs. exceeding the very short scape: fl. vari-colored, yellowish and purplish, segms. very acute. Persia.—Early.

præcox. Leafy, lvs. broad at base and long-pointed, st. 12–18 in.: fl. red or scarlet with purplish bottom, segms. acute or cuspidate. S. Eu. to Asia.—Early.

præstans. Medium, 12–18 in., with broad short-pointed lvs.: fl. light red, segms. nearly or quite obtuse but cuspidate. Bokhara.—Early.

primulina. Low, 12 in. or less: lvs. very narrow: fl. pale primrose, fragrant, segms. narrow and acute. Algeria.

pulchella. Very low, 6 in. or less: lvs. narrow, next the ground: fl. mauve-red, yellow in bottom, segms. acute. S. W. Asia.

rubra maxima: *T. Gesneriana* form.

saxatilis. Medium, 12–18 in.: lvs. narrow: fls. usually 2, mauve with yellow bottom, fragrant, segms. acute. Crete.

Sprengeri. Medium, 8–18 in., with long narrow acute lvs.: fl. orange-scarlet with darker bottom, segms. cuspidate. Armenia.—Very late.

stenopetala: *T. acuminata.*

stellata. Medium: lvs. long and narrow: fl. white or yellow without darker bottom, segms. short-acute. Himalaya, Afghanistan.—Midseason.

strangulata. Like *T. suaveolens* but taller, mostly red-fld. with black blotch but running to yellows. Italy.

suaveolens. DUC VAN THOL T. Low, 4–8 in., broad-lvd.: fl. bright yellow, very fragrant, segms. acute. S. Eu.—Very early.

sylvestris (*T. florentina*). Medium, 9–18 in.: lvs. narrow: fl. (sometimes 2) bright yellow, fragrant, segms. narrow and acute. Eu.—Midseason to late.

Tubergeniana. Lvs. long-acuminate: fls. large, bright crimson with dark-margined blotch, segms. long-pointed. Bokhara.

turkestanica: *T. biflora* var.

viridiflora. Tall. to 2 ft., with large broad lvs.: fl. large, light soft green with yellowish or whitish edges, segms. abruptly acute or cuspidate. Cultigen.—Midseason to late. Var. **præcox** is an early large pale green kind.

Willmottæ. Tall, 18 in. or more, with broad long-acute lvs.: fl. large, clear yellow, slightly fragrant. Asia Minor.—Late.

TUMION: *Torreya.*

TUNA: *Opuntia.*

TUNG-OIL-TREE: *Aleurites Fordii.*

TUNICA. *Caryophyllaceæ.* Herbaceous wiry-stemmed annuals and perennials with small narrow lvs. and fl.-heads similar to Dianthus but smaller; native in the Medit. region. Grown as edging plants in the border or rock-garden. Propagated by seed and division.

prolifera. Ann. to 1½ ft.: lvs. linear, very small: fls. pinkish or lilac, small. Eu.

Saxifraga (*Petrorhagia Saxifraga*). TUNIC-FLOWER. COAT-FLOWER. Hardy per. to 10 in., tufted, spreading: lvs. narrow, linear, to ½ in. long: fls. pink or pale purple, ¼ in. across, summer. Eu.; adventive in E. U. S. Var. **alba** has white fls., **rosea** rose-pink, and **flore-pleno** double fls. to ½ in. across.

velutina. Similar to *T. prolifera* but pubescent and with 2-parted petals. S. Eu.

TUNIC-FLOWER: *Tunica Saxifraga.*

TUNKA: *Benincasa hispida.*

TUPELO: *Nyssa.*

TUPIDANTHUS. *Araliaceæ.* An Indian small tree which eventually becomes a tall climber, suitable for cult. in warm climates and sometimes raised under glass for its abundant glossy-green foliage. **T. calyptratus.** Lvs. palmately divided into 7–9 entire drooping lfts. to 7 in. long: fls. green, borne in compound umbels.

TURGID: swollen from fullness.

TURKEY-BEARD: *Xerophyllum.*

TURKS-TURBAN: *Siphonanthus indica.*

TURMERIC: see *Curcuma longa.*

TURNIP (*Brassica Rapa*). Grown mostly as a biennial for the underground tubers, seed being produced from tubers planted out after the winter or that may be left in the ground in very mild climates; the early varieties often run to seed the first year if sown very early and not gathered at the maturity of the tuber. Turnips are hardy cool-season plants, of unknown nativity, but they will not withstand as much frost as rutabaga.

The true turnips are mostly "flat," that is, not bearing a long neck and the tuber broad rather than long although there are exceptions in the shape; most of them grown in this country are white- or light-fleshed; the substance is less firm and durable than in the rutabaga. All the usual turnips are short-season plants; the supply for late autumn and winter use in the northern states is grown from seeds sown in July,—"on the twenty-fifth of July sow your turnips wet or dry" is an old saw. The seeds are broadcast or sown in drills that are 10–20 inches apart; it is necessary to thin the plants well if the best tubers are desired. For drill culture, 1 to 2 pounds of seed are required to the acre. For late spring or summer use, seeds are sown, of early varieties, as soon as the ground is fit. The commonest pest of turnips is aphis, which is controlled (as on cabbage) by thorough sprays of Black Leaf 40 or the whale-oil or fish-oil soaps.

TURNIP, INDIAN: *Arisæma triphyllum.*

TURPENTINE-TREE: *Syncarpia glomulifera.*

TURRÆA. *Meliaceæ.* Trop. or warm-temp. trees or shrubs of Asia and Afr., with alternate simple lvs., white fls. and capsular frs.; grown out-of-doors in S. Calif. and sometimes under glass.

obtusifolia. Broad attractive shrub to 3 ft. or more: lvs. obovate, to 2 in. long, sometimes 3-lobed near tip: fls. 1½ in. long, many and giving the bush a pleasing effect; petals very narrow, 1 in. or more long. S. Afr.

TURTLE-HEAD: *Chelone.*

TUSSACIA. *Gesneriaceæ.* Trop. American herbs with creeping rhizomes, opposite lvs., and tubular fls. in axillary clusters, the calyx colored; one species intro. in S. Calif.

pulchella. To 1½ ft.: lvs. to 10 in. long and 4 in. across, toothed, pale beneath: fls. orange-yellow marked with red, ¼ in. across; calyx salmon-colored, ½ in. long. W. Indies.

TUSSILAGO. *Compositæ.* One stemless per. herb native in Eu., India and Asia and nat. in N. Amer., sometimes grown as a ground-cover and to hold banks. Propagated by root-cuttings. **T. Farfara.** COLTSFOOT. Lvs. cordate-orbicular, to 7 in. across, lobed and toothed, white-tomentose beneath: heads solitary, on scaly scapes to 1½ ft. high in very early spring before the lvs., the ray-fls. bright yellow; pappus of white bristles, prominent in the dandelion-like head.

TUTSAN: *Hypericum Androsæmum.*

TWAYBLADE: *Liparis.*

TWEEDIA: *Oxypetalum.*

TWIN-BERRY: *Mitchella repens.* **-Leaf:** *Jeffersonia diphylla.*

TWINFLOWER: *Linnæa borealis.*

TWINSPUR: *Diascia.*

TWISTED STALK: *Streptopus.*

TYPHA. CAT-TAIL. The only genus of *Typhaceæ.* Per. herbs in swamps, having creeping rootstocks, tall erect unbranched sts., long, linear, flat, erect, parallel-veined lvs., and unisexual fls. in dense terminal spikes of which the staminate is uppermost; species few, widely distributed in temp. and trop. regions.

Cat-tails are sometimes employed in bog-gardening and on the margins of pools for permanent stately effect. The leaves are used in basketry and for bottoming chairs. Propagated usually by division; sometimes by seeds planted in pots in water.

angustifolia. To 8 or 10 ft.: lvs. to ½ in. across: spikes light brown, the staminate and pistillate parts separated. Amer., Eu., Asia.

latifolia. To 8 ft.: lvs. to 1 in. across: spikes dark brown to black, the staminate and pistillate parts contiguous. N. Amer., Eu., Asia.

U

UDO: *Aralia cordata.*

ULEX. Furze. Gorse. Whin. *Leguminosæ.* Very spiny shrubs with very small spine-tipped lvs. which are often scale-like, yellow papilionaceous fls., and small ovoid pods; grown for ornament and cover on poor and sandy soils.

Seeds should be sown where the plants are to stand or singly in pots, for they do not bear transplanting well. Propagated also by cuttings or grafting on *U. europæus.* Require winter protection in the North.

europæus. To 4 ft.: fls. fragrant, ¾ in. long, in spring or in warm climates flowering all the year. Eu. Var. **plenus** has double fls.

nanus. Dwarf, to 2 ft.: fls. about ½ in. long, in autumn. W. Eu.

ULLUCUS. *Basellaceæ.* One decumbent or climbing per. native in Peru, Bolivia and Chile, grown there for the edible tuberous roots and sometimes planted in our territory for interest. **U. tuberosus.** Ulluco. Lvs. alternate, fleshy, ovate: fls. small, golden-yellow, in large axillary racemes.—Propagated by division of tubers.

ULMACEÆ. Elm Family. Trees and shrubs of about 15 genera widely distributed, having alternate simple lvs., small bisexual or unisexual fls. without petals, with 3–9-parted calyx and as many or twice as many stamens, superior 1-celled ovary, and fr. a samara, nut or drupe. Several genera are grown for ornament, as Celtis, Hemiptelea, Holoptelea, Trema, Ulmus and Zelkova.

ULMARIA: *Filipendula.*

ULMUS. Elm. *Ulmaceæ.* Deciduous trees of the north temp. zone, with alternate toothed short-stalked lvs., inconspicuous fls. in clusters or racemes usually before the lvs., and fr. a flat nutlet surrounded by a wing, making a samara.

Elms are favorite shade and avenue trees and of easy cultivation. Practically all the species here listed are hardy in the North, some of them being among the hardiest lawn and street trees. However, they are attacked by several insects and in such case should be sprayed every year for best results. They will bear transplanting well. Propagated by seeds sown as soon as ripe, by layers in autumn and some species by greenwood cuttings under glass. Varieties may be grafted on common stocks.

alata. Wahoo E. To 50 ft., the branchlets with 2 broad corky wings: lvs. small, to 2½ in. long, oblong: fr. about ⅓ in. long, with incurved beaks, covered with long white hairs. Va. to Fla. and Tex.

americana. American, White, or Water E. To 120 ft.: lvs. to 6 in. long: fls. on slender drooping stalks: fr. with densely ciliate margins and deeply notched wings. Newf. to Fla. and Rocky Mts.—Very commonly planted. Var. **aurea**, lvs. yellow. Var. **columnaris**, of columnar form. Var. **pendula**, branches long and drooping.

asplenifolia: *U. glabra* var. *crispa.*

belgica: *U. hollandica* var.

Berardii: *U. campestris* var.

betulifolia: *U. campestris* var. *nigrescens.*

campestris (*U. procera. U. sativa*). English E. Very tall tree, to 150 ft. (whence the name *procera*, very tall), with more or less pubescent young shoots, usually suckering: lvs. 2–4 in. long, mostly relatively small, broadly oval or ovate, oblique at base, acuminate, roughish above and pubescent beneath: seed above the middle in the notched fr. W. and S. Eu.; in Britain supposed to be native only in S. England.—Popular tree in northeastern states; rarely produces seeds and is propagated by suckers. The continental form is var. **australis**, with thicker firm sharper-pointed lvs. Var. **argenteo-variegata** (var. *variegata*), lvs. marked white. Var. **Berardii.** Small bushy tree with small rather narrow lvs. 1–2 in. long, coarsely notched. Vars. **nigrescens** (*U. nigricans. U. betulifolia*). Lvs. elliptic or ovate, doubly serrate, dark-colored. Var. **purpurascens** (*U. myrtifolia*). Lvs. small, usually 1 in. or less long, purplish. Var. **purpurea.** Lvs. dark purple, of ordinary size. Var. **Vanhouttei.** Lvs. ovate, coarsely serrate, yellowish.—The name *campestris* has been variously applied by early authors, but by long usage it has been reserved to the English elm and it seems better to retain the name here particularly as the tree is widespread in cultivation.

chinensis: *U. parvifolia.*

Clemmeri: *U. hollandica* var. *Klemmeri.*

crassifolia. Cedar E. Medium-sized tree with stiff corky or scaly branches: lvs. stiffish, 1 or 2 in. long, oblong to ovate-oblong, obtuse or nearly so, closely serrate, rough above and somewhat pubescent underneath. Miss. to Tex. and N. Mex.; sometimes planted in its region. Blooms in autumn.

Dampieri: *U. foliacea* var.

Dauvessei: *U. hollandica* var.

Dippeliana: *U. hollandica.*

effusa: *U. lævis.*

exoniensis: *U. glabra* var. *fastigiata.*

foliacea (*U. nitens*). Smoothleaf E. Pyramidal or upright tree, often with corky branches, commonly suckering; young branches mostly glabrous: lvs. not large, 2–4 in. long, glossy and nearly or quite smooth above and nearly or quite glabrous underneath, obliquely ovate to obovate, doubly serrate: fr. obovate, with seed close to upper notch. N. Afr., Eu. and W. Asia. Var. **Dampieri.** Narrow-topped tree with broad very deeply toothed lvs. crowded on short branches. Var. **Koopmannii.** Head close, oval: lvs. small, grayish-puberulent beneath and branches often corky. Var. **pendula.** Branches very slender and drooping. Var. **propendens.** Branches stiff but drooping: lvs. rather small, and branches corky. Var. **stricta** (*U. stricta*). Cornish E. Branches erect and top narrow: lvs. 2–3 in. long, oval or broadly obovate, more or less tufted-pubescent underneath. Var. **suberosa.** Small tree, branches corky: lvs. small and roughish above, elliptic to obovate. Var. **umbraculifera.** Globe E. Head dense and broad: lvs. 2–3 in. long, elliptic to broad-ovate, somewhat rough above. Var. **Webbiana.** Head narrow: lvs. 2–3 in. long, ovate to obovate, roughish above, folded lengthwise. Var. **Wheatleyi.** Guernsey or Jersey E. More stiff and erect than the true Cornish elm, lvs. broader and less tufted underneath. Var. **Wredei.** Narrow-topped with crowded yellowish deeply toothed broad lvs.

fulva (*U. Heyderi*). Slippery E. Small or medium-sized open-headed tree with pubescent branchlets: lvs. large, to 6 or 8 in. long, obovate or broadly oblong, acuminate, coarsely serrate, very rough above and pubescent beneath. Canada to Fla.

glabra (*U. scabra. U. montana*). Wych E. Scotch E. Wide-spreading large tree not suckering: lvs.

large, dull green, 4–8 in. long, mostly obovate, coarsely double-serrate, rough above and pubescent beneath: young parts pubescent: fr. large and abundantly produced, with seed in center. Great Britain to Siberia. —Much planted in N. Amer., in several forms. Var. **atropurpurea.** Lvs. purple. Var. **Camperdownii.** Camperdown E. Branches gracefully drooping forming a globose head; grown as a top-worked head on a straight elm stock. Var. **cornuta** (*U. tridens* and *triserrata*). Horned E., from the two long projections or lobes on the shoulders or apex of the larger lvs. Var. **crispa** (*U. asplenifolia, incisa* and *urticæfolia*). Fernleaf E. Lvs. thick and narrow (1–2 in. broad) heavily veined and the margins crispate-serrate; sometimes pendulous; slow-growing tree. Var. **fastigiata** (*U. exoniensis*). Exeter E. Branches erect, forming a narrow-headed tree. Var. **lutescens.** Lvs. yellow. Var. **nana.** Bush E. Bush-like, 4–6 ft., small-lvd. Var. **pendula.** Tabletop E. Branches stiffly drooping and more or less elbowed, making a spreading top; worked on erect stocks. Var. **variegata.** Lvs. variegated.

Heyderi: *U. fulva.*

hollandica (*U. Dippeliana* and *U. major*). Holland or Dutch E. A group of forms supposed to be hybrid derivatives of *U. glabra* and *U. foliacea*, with mostly large and rather prominently stalked ovate or broadly elliptic lvs. that are nearly smooth and usually glossy above and little pubescent underneath and with unequal base, the veins 14 pairs or less: young parts glabrous or nearly so: seed near the notch of the fr.: large broad trees, often with drooping branches, suckering from the trunk. Var. **belgica** (*U. latifolia*). Belgian E. Young shoots becoming smooth: lvs. 4–5 or 6 in. long, mostly rather narrowly obovate, soft-pubescent beneath and veins 14–18 pairs. Var. **Dauvessei.** Tree with broad pyramidal head and hairy branchlets: lvs. soft-pubescent beneath, very unequal at base, to 4 or 5 in. long; perhaps to be associated with *U. glabra.* Var. **Dumontii.** Similar to var. *belgica* but with narrow head. Var. **Klemmeri.** Tree with narrow pyramidal head, and young branches more or less short-hairy: lvs. 3–4 in. long, ovate, roughish above and slightly pubescent beneath. Var. **pendula.** Downton E. Branchlets somewhat pubescent when young, drooping: lvs. about 3–4 in. long, elliptic, rather thick, smooth above and slightly pubescent underneath. Var. **Pitteursii.** Strong-growing: lvs. large, to 5 in. long, broadly ovate to obovate, more or less rough and pubescent; perhaps nearer to *U. glabra.* Var. **vegeta.** Huntingdon E. Vigorous large tree, with ascending branches: lvs. elliptic, to 5 or 6 in. long, mostly smooth above and pubescent beneath only in the axils, veins 14–18 pairs.

incisa: *U. glabra* var. *crispa.*

japonica. Large broad-topped tree with pubescent young branches which are often somewhat drooping: lvs. 3–5 in. long, obovate or oblong, acuminate, veins 12–16 pairs, roughish above and pubescent underneath: seed near apex of fr. Farther Asia.

Klemmeri, Clemmeri: *U. hollandica* var.

lævis (*U. effusa* and *U. pedunculata*). European White E. Tall open-headed tree with branchlets at first pubescent: lvs. to 4 or 5 in. long, oblong or obovate, usually broadest above middle, acuminate, unequal at base, mostly glabrous and smooth above, pubescent underneath. Cent. Eu. and Asia.

latifolia: *U. hollandica* var. *belgica.*

major: *U. hollandica.*

montana: *U. glabra.*

myrtifolia: *U. campestris* var. *purpurascens.*

nigricans: *U. campestris* var. *nigrescens.*

nitens: *U. foliacea.*

parvifolia (*U. chinensis*). Chinese E. Open-headed tree, partially evergreen in mild climates, blooming in late summer or autumn: lvs. small and firm or thick, 1–2 or 3 in. long, elliptic to ovate, shining and mostly smooth above, becoming nearly or quite smooth underneath: fr. about ⅓ in. long: branchlets thinly pubescent. China, Japan; hardy N.

pedunculata: *U. lævis.*

Pitteursii: *U. hollandica* var.

procera: *U. campestris.*

pumila. Dwarf E. Small tree, sometimes shrub-like, with slender often drooping branches: lvs. 2–3 in. long, elliptic to oblong, long- or short-pointed, not deeply serrate, smooth above, mostly glabrous underneath or with axillary tufts: fr. about ½ in. long, from early spring fls.: branchlets glabrous or pubescent only when young: foliage not lustrous nor coriaceous. Turkestan to N. China; hardy N. Var. **arborea** (*U. turkestanica*). A tall tree with narrowly ovate or ovate-lanceolate lvs. shining above.

racemosa (*U. Thomasii*). Rock E. Large tree, with very corky branches and pubescent buds: lvs. large, to 4 or 6 in. long, elliptic to oblong-obovate, rather short-pointed, glabrous or nearly so above, pubescent underneath, coarsely serrate: fr. ½ in. or more long, notched, pubescent. Que. to Tenn. and Neb.

sativa: *U. campestris.*

scabra: *U. glabra.*

serotina. September E. Medium-sized tree with somewhat pendulous often corky branches, blooming in autumn: lvs. small, 2–3 in. long, oblong or somewhat obovate, acuminate, veins about 20 pairs, smooth and shining above, pubescent on veins underneath. Ky. south and west, planted in its region.

stricta: *U. foliacea* var.

Thomasii: *U. racemosa.*

tridens: *U. glabra* var. *cornuta.*

triserrata: *U. glabra* var. *cornuta.*

turkestanica: *U. pumila* var. *arborea.*

urticæfolia: *U. glabra* var. *crispa.*

vegeta: *U. hollandica* var.

viminalis. Willow E. Slender tree with drooping spray and narrow oval or oblanceolate incised lvs., sometimes variegated: fr. not known. Eu., of doubtful origin, probably a form of *U. campestris.*—Plants of another species have been grown in the U. S. under this name.

Webbiana: *U. foliacea* var.

Wheatleyi: *U. foliacea* var.

Wredei: *U. foliacea* var.

UMBEL: corymbose or indeterminate cluster with branches or rays arising from a common point and about equal in length, resembling framework of umbrella; umbels are characteristic of the Umbelliferæ.

UMBELLIFERÆ. Parsley or Carrot Family. A large and widely distributed family, mostly in temp. and boreal regions, of about 250 genera, furnishing many plants grown for food, flavoring, medicinal products, and some for ornament. Commonly herbs, rarely somewhat shrubby, with alternate mostly compound lvs., small unshowy bisexual fls. in simple or compound umbels or sometimes heads, having 5-lobed calyx, 5 petals and stamens, inferior 2-celled ovary, and dry fr. of 2 ribbed carpels mostly bearing oil-tubes and splitting apart. They are mostly plants of strong or pungent odor, many of them with poisonous qualities, some of them yielding spices. The genera chiefly known to cult. are Ægopodium, Anethum, Angelica, Anisotome, Anthriscus, Apium, Arracacia, Astrantia, Athamanta, Bupleurum, Carum, Chærophyllum, Cicuta, Conium, Coriandrum, Crithmum, Cuminum, Daucus, Erigenia, Eryngium, Ferula, Fœniculum, Hacquetia, Harbouria, Heracleum, Hydrocotyle, Laserpitium, Levisticum, Ligusticum, Lomatium, Meum, Molopospermum, Myrrhis, Osmorhiza, Pastinacia, Petroselinum, Peucedanum, Pimpinella, Sium, Taenidia, Trachymene.

UMBELLULARIA. *Lauraceæ.* One attractive evergreen tree to 80 ft. high, native in Calif. and Ore. **U. californica.** California-Laurel. Lvs. ovate-oblong to lanceolate, to 5 in. long, shining above: fls. yellowish-green, in many-fld. umbels: fr. a greenish or purplish drupe to 1 in. long.—It thrives in fairly moist soils. Propagated by seeds.

UMBILICUS: *Cotyledon.*

UMBRELLA-LEAF: *Diphylleia cymosa.* Plant: *Cyperus alternifolius, Peltiphyllum peltatum.* -Tree: *Magnolia tripetala.* -Tree, Texas: *Melia Azedarach* var. *umbraculiformis.* -Wort: *Allionia.*

UMKOKOLO: *Dovyalis caffra.*

UNGNADIA. *Sapindaceæ.* One shrub or tree to 30 ft., native from Tex. to Mex. and occasionally planted in the S. **U. speciosa.** TEXAN, MEXICAN or SPANISH BUCKEYE. Lvs. alternate, of 5–9 ovate-lanceolate shining lfts. to 5 in. long, wavy-toothed: fls. rose, 1 in. across, in clusters in Apr.–May before the lvs.: fr. a leathery 3-valved caps. 2 in. across, with large black seeds. Not hardy in northern states.

UNICORN-PLANT: *Proboscidea.*

UNIFOLIUM: *Maianthemum.*

UNIOLA. *Gramineæ.* N. American per. grasses with prominent flat 2-edged spikelets borne in panicles; one species grown for ornament. See *Grasses.*

latifolia. To 5 ft.: lvs. to 9 in. long and 1 in. wide, rough on margins: spikelets to 1½ in. long, on slender hanging stalks, the panicles to 10 in. long and drooping. Pa. to Fla. and Tex.

UNISEXUAL: of one sex; staminate only or pistillate only.

UPAS-TREE: *Antiaris toxicaria.*

URBINIA. *Crassulaceæ.* Three species of low herbs, sometimes acaulescent, probably all Mexican, differing from Echeveria in the cone-shaped not strongly angled corolla and other characters: lvs. thick and rigid, densely imbricated: fls. few, in cymose clusters; stamens 10. **U. agavoides** (*Echeveria* and *Cotyledon agavoides*) has a very short thick st. or caudex: lvs. ovate, to 2 in. long, spine-tipped: corolla reddish with yellow tips.

URD: *Phaseolus Mungo.*

URERA. *Urticaceæ.* Trop. shrubs or trees often armed with stinging hairs, having alternate simple lvs. and unisexual fls. in panicles; one species sometimes planted in S. Fla. and southwards.

caracasana. Shrub to 20 ft.: lvs. ovate, cordate at base, the largest to 1 ft. long and 10 in. wide: fls. in clusters from the branches: fr. vermilion-colored, very small. Trop. Amer.—See *Bœhmeria Urera.*

URGINEA. *Liliaceæ.* Bulbous herbs with basal lvs. and whitish, yellowish or rose fls. in racemes terminating the scapes, the perianth-segms. distinct; the bulbs are collected in the wild for their medicinal properties. Also occasionally grown for ornament but only partially hardy.

maritima (*U. Scilla*). SEA-ONION. To 3 ft.: lvs. to 1½ ft. long and 4 in. wide: fls. whitish, ½ in. long, on racemes to 1½ ft. long. Canaries to Syria, S. Afr.

Scilla: *U. maritima.*

UROPAPPUS. *Compositæ.* Low ann. herbs of W. N. Amer. with basal lvs. and solitary heads of yellow ligulate fls.; pappus of scales or awns. Sometimes seen in the flower-garden.

linearifolius (*Microseris linearifolia*). To 1½ ft.: lvs. linear, to 6 in. long, entire, toothed or lobed: heads to 1¾ in. across, with white or brown pappus. Wash. to Calif. and New Mex.

URSINIA. *Compositæ.* S. African ann. or per. herbs or subshrubs, strongly scented, the lvs. alternate, and pinnately cut; heads daisy-like, solitary or loosely clustered; pappus of scales and bristles.

The annual flower-garden ursinias are grown from seed planted indoors or directly in the open.

anthemoides (*Sphenogyne anthemoides*). Ann. to 1 ft.: lvs. pinnate into linear lobes: heads solitary, on long drooping sts., rays yellow, purplish on the outside. —In the N., the plant does well in the cool greenhouse.

pulchra (*Sphenogyne speciosa*). Ann., branching, to 2 ft.: lvs. 2-pinnate into linear lobes: heads yellow or orange, 2 in. across, solitary, rays spotted brown-purple at the base.

URTICA. NETTLE. *Urticaceæ.* Herbs with stinging hairs, opposite toothed or cut lvs. and very small unisexual fls. in axillary clusters or panicles; one species sometimes grown for medicinal properties and another for ornament. Propagated by seeds and cuttings.

dioica. STINGING N. Per. to 4 ft.: lvs. ovate, to 5 in. long and 3 in. wide, pubescent beneath: fls. in clusters in branched panicles. Eu., Asia; nat. in N. Amer.

pilulifera. ROMAN N. Ann. to 2 ft.: lvs. ovate or heart-shaped, to 3 in. long: staminate fls. in clusters, pistillate in globular heads. S. Eu.—Sometimes grown under glass N.

utilis: *Bœhmeria nivea.*

URTICACEÆ. NETTLE FAMILY. More than 40 widely distributed genera of herbs, shrubs or trees with simple lvs., small mostly unisexual fls. having 3–5-parted calyx, 3–5 stamens, superior 1-celled ovary and fr. an achene. Some of the kinds bear sharp stinging hairs. The plants are of minor importance horticulturally. A few genera are grown for ornament, for fiber, or as drug plants, as Bœhmeria, Debregeasia, Gesnouinia, Helxine, Parietaria, Pellionia, Pilea, Urera, Urtica.

UTRICLE: a small bladder; a bladdery 1-seeded fruit.

UTRICULARIA. BLADDERWORT. *Lentibulariaceæ.* Aquatic herbs or terrestrial epiphytes of wide distribution, of minor importance in hort. although several names persist in the literature. The group has recently been divided; under such treatment *Utricularia vulgaris,* of Eurasia (with a thick blunt spur), remains in the genus, and there are similar North American plants that may be employed in aquaria, as *U. macrorhiza* (or *U. vulgaris* var. *americana*) with an awl-like spur on the fl. The other species most frequently mentioned in hort. literature pass into other genera although for the present purposes of the horticulturist they may well be retained in Utricularia: *U. bifida* and *U. prehensilis* are species of Stomoisia under recent treatment; *U. alpina*

(*U. montana*), *U. Endresii* which is very much like *U. alpina* except in the smaller and thinner lvs. and lilac fls. with yellow palate, *U. janthina* and *U. reniformis*, are species of Orchyllium; *U. longifolia* is Calpidisca. Two plants have been described as *U. longifolia*; both are species of Calpidisca. The *U. longifolia* of Gardner, 1843, is from Brazil; *U. longifolia* of Sander, 1893, is from Mt. Roraima, S. Amer. and *U. Forgetiana* may be the same.

alpina (*U. montana* of old literature but now *Orchyllium alpinum*) is a trop. American plant with clusters of hollow tuber-like bladders on the roots at base of st.: lvs. elliptic-lanceolate, to 6 in. long: fls. orchid-like, 1½ in. across, white with yellow palate, 1–4 on a scape.—This plant is apparently in cult.

UVA-URSI: *Arctostaphylos.*

UVULARIA. BELLWORT. *Liliaceæ.* Per. herbs from rootstocks, having alternate sessile or perfoliate lvs. and yellow bell-shaped drooping fls. mostly solitary at ends of branches.

Bellworts are sometimes grown in the wild-garden. Of easy cultivation in rich soil and shady locations. Propagated by division.

flava: *U. perfoliata* var.

grandiflora. To 1½ ft.: lvs. oblong to ovate, to 5 in. long, perfoliate, pubescent beneath: fls. lemon-yellow, to 1½ in. long. Que. to Ga. and Kans.

perfoliata. To 1½ ft.: lvs. oblong to ovate, to 5 in. long, glabrous, perfoliate: fls. pale yellow, 1¼ in. long. Que. to Fla. and Miss. Var. **flava** has deeper yellow fls.

sessilifolia (*Oakesia* and *Oakesiella sessilifolia*). To 1 ft.: lvs. oblong-lanceolate, to 3 in. long, sessile: fls. greenish-yellow, 1¼ in. long. N. B. to Ga. and Ark.

V

VACCARIA VULGARIS: *Saponaria Vaccaria.*

VACCINIUM. BLUEBERRY. CRANBERRY. *Ericaceæ*; by some authors placed in *Vacciniaceæ.* Shrubs with alternate deciduous or evergreen simple lvs. which often turn brilliant colors in autumn, cylindrical to wheel-shaped fls., and fr. a berry capped by the persistent calyx; native in the northern hemisphere and mts. of tropics. Some authors divide the group into several genera.

Some of the vacciniums are grown for ornament in borders or colonized in wild areas. Others are grown for the edible fruits. Most of them require peaty or sandy soils and do not thrive in limy lands. For culture see *Blueberry* and *Cranberry.*

arboreum (*Batodendron arboreum*). FARKLEBERRY. SPARKLEBERRY. To 30 ft., evergreen in the S. but deciduous northward: lvs. to 2 in. long, shining above: fls. white, ¼ in. long, in racemes to 2½ in. long, July–Aug.: fr. black, ¼ in. across. Va. to Fla. and Tex.; not hardy N.

canadense. Deciduous, twiggy, 1–2 ft., making colonies: lvs. narrow, 1 in. or more long, soft-pubescent both sides: fls. greenish-white to reddish, about ¼ in. long: fr. blue, more or less glaucous. Lab. to Man. and Va.

corymbosum. HIGHBUSH or SWAMP B. or WHORTLEBERRY. Deciduous, to 15 ft.: lvs. to 3 in. long: fls. white or pinkish, to ⅓ in. long, in clusters in May: fr. blue-black, pruinose, ⅓ in. across. Me. to Fla. and La. Var. **pallidum** (*V. pallidum*), lvs. slightly glaucous.

Dunalianum. Large shrub: lvs. ,to 4 in. long, leathery: fls. ⅕ in. long, in racemes to 3 in. long: fr. ⅙ in. across. Himalayas.—To be planted S.

erythrocarpum (*Oxycoccus erythrocarpus*). Deciduous, to 6 ft.: lvs. to 3 in. long: fls. pink, ⅓ in. long, 4-parted, solitary, nodding, May: fr. red turning purplish, ¼ in. across. Va. to Ga.

hirsutum. HAIRY HUCKLEBERRY. Deciduous, to 3 ft.: lvs. to 2½ in. long, pubescent: fls. white or pinkish, to ½ in. across, in short dense racemes, May–June: fr. purplish-black, ¼ in. across. N. C. to Ga.

hybridum: listed name.

macrocarpon (*Oxycoccus macrocarpus*). LARGE or AMERICAN C. Evergreen, sts. creeping, to 3 ft. long: lvs. to ¾ in. long, whitish beneath: fls. pink, 4-parted, ⅓ in. long, in lateral clusters, June–Aug.: fr. red, to ¾ in. across. Newf. to N. C. and Minn.

Myrtillus. WHORTLEBERRY. Deciduous, to 2 ft.: lvs. to 1¼ in. long: fls. pinkish, ¼ in. long, solitary, May: fr. black, bloomy, ⅓ in. across. Eu., N. Asia.

ovatum. To 12 ft., evergreen: lvs. to 1¼ in. long: fls. white or pink, ¼ in. long, in short racemes, July–Aug.: fr. black, ⅓ in. across. B. C. to Calif.—Sold for winter green.

Oxycoccus. SMALL or EUROPEAN C. Evergreen, sts. creeping, to 1 ft. long: lvs. to ⅓ in. long, glaucous beneath: fls. pink, 4-parted, ¼ in. long, in terminal clusters, May–July: fr. red, ⅓ in. across. N. Eu., N. Asia, E. N. Amer.

pallidum: *V. corymbosum* var.

pennsylvanicum. LOWBUSH B. Deciduous, to 2 ft.: lvs. to 1½ in. long, shining: fls. greenish-white, ¼ in. long, in small clusters, Apr.–May: fr. bluish-black, rarely white or reddish, to ½ in. across. Newf. to Wis. and Va.—Grown for its fr., and now greatly improved. Var. **nigrum** has black fr.

stamineum (*Polycodium stamineum*). DEERBERRY. Deciduous, to 3 ft., much branched: lvs. to 4 in. long, glaucous beneath: fls. white or purplish, ¼ in. long, in racemes to 2½ in. long, May–June; stamens exserted: fr. greenish, ⅓ in. across. Mass. to Fla. and La.

vacillans. DRYLAND B. Deciduous shrub to 3 ft.: lvs. oval to obovate, to 2 in. long, glaucous underneath: fls. white or tinged red, ¼ in. or more long, in dense clusters: fr. blue and glaucous. Me. to Ga. and Mo.

virgatum. RABBITEYE B. Deciduous, to 12 ft.: lvs. to 2 in. long, pale beneath: fls. white or pink, ⅓ in. long, in short racemes, Apr.–May: fr. black, ¼ in. across. Va. to Fla. and La.

Vitis-idæa. COWBERRY. To 1 ft., creeping, evergreen: lvs. to 1¼ in. long, shining above: fls. white or pink, ¼ in. long, in short nodding racemes, May–June. Eu., N. Asia. Var. **minus.** MOUNTAIN C. Dwarf forming mats: lvs. to ¾ in. long: fls. pink or red. Alaska to Mass.

VACHELLIA: *Acacia Farnesiana.*

VAGNERA: *Smilacina.*

VALERIAN: *Valeriana.* **African:** *Fedia Cornucopiæ.* **Greek:** *Polemonium cæruleum.* **Red:** *Centranthus ruber.*

VALERIANA. VALERIAN. *Valerianaceæ.* Per. herbs or shrubs of the north temp. zone, with strong-smelling roots, simple or pinnate lvs., small white or rose fls. in cymes or spikes, stamens mostly 3, calyx pappus-like, and fr. a flattened achene.

Valerians are of easy culture in the flower-garden or border. Propagated by seeds or division.

acutiloba. To 1½ ft., diœcious: basal lvs. obovate, entire; st.-lvs. pinnately divided into lanceolate to linear entire segms. Wyo. to New Mex.

alba: sometimes means *Centranthus ruber* var. *alba.*

alliaræfolia. Tall: lvs. cordate-ovate, toothed or wavy: fls. pink. E. Eu., W. Asia.

coccinea: *Centranthus ruber.*

dioica (*V. palustris*). To 1 ft., usually diœcious: lvs. broad-ovate, lower st.-lvs. lyrate-pinnatifid, upper divided into linear lfts. Eu.

echinata: *Valerianella echinata.*

excelsa. Bearing runners ending in rosettes: lvs. pinnately divided into 3–5 pairs of toothed lfts.: fls. bisexual, reddish or white. Eu.

montana. To 1 ft., diœcious: lvs. ovate or the upper linear-lanceolate, entire or toothed: fls. bright rose. Eu., W. Asia.

officinalis. COMMON V. GARDEN-HELIOTROPE. To 5 ft.: lvs. pinnately divided into 7–10 pairs of ovate-oblong to lanceolate segms., entire or toothed: fls. bisexual, whitish, pinkish or lavender, very fragrant. Eu., N. Asia; nat. in N. Amer. Var. **alba** has white fls. and **rubra** red.

palustris: *V. dioica.*

Phu. To 3 ft.: basal lvs. ovate-oblong, entire or toothed at base; st.-lvs. pinnately divided into 3–4 pairs of oblong entire segms.: fls. bisexual, whitish or pinkish. Caucasus. Var. **aurea,** young shoots golden-yellow.

pyrenaica. To 4 ft.: basal lvs. cordate-ovate, coarsely toothed; st.-lvs. 3-parted into toothed segms., the terminal largest: fls. bisexual, pale rose. Pyrenees.

rubra: *Centranthus ruber.*

supina. To 6 in.: lvs. obovate or the upper lanceolate, entire or slightly toothed, ciliate on edges: fls. pink. Austria.

uliginosa. To 2½ ft.: basal lvs. oblong, nearly entire: st.-lvs. pinnately divided into 3–15 lfts.: fls. pink to white. Que. to N. Y. and Mich.

VALERIANACEÆ. Valerian Family. Widely distributed herbs or shrubs of about 9 genera: lvs. opposite, simple or pinnate: fls. small, bisexual or unisexual, with gamopetalous 5-lobed corolla, usually 1–3 stamens, and inferior 1–3-celled ovary: fr. an achene. Centranthus, Fedia, Valeriana and Valerianella are grown as flower- or vegetable-garden subjects.

VALERIANELLA. *Valerianaceæ.* Ann. herbs mostly native in the Medit. region, with entire basal lvs., entire or toothed st.-lvs., small whitish, bluish or rose fls. in cymes, stamens usually 3, and fr. with 2 empty cells and 1 fertile cell; two are grown as pot-herb or salad plants and others for ornament or interest.

Corn-salad is of easy cultivation in spring and fall. Successioned sowings may be made and it takes six to eight weeks for maturity. Plants should be thinned or transplanted to stand about 6 inches apart in the row.

congesta. To 1½ ft.: lvs. oblong, entire: fls. rose, to ⅓ in. long, the corolla 2-lipped and spurred: fr. usually broadly winged. B. C. to Calif.

echinata (*Valeriana echinata*). To 1 ft.: st.-lvs. wavy-toothed or cut: fls. pink: fr. linear, 3-angled, with 3 reflexed teeth. S. Eu.

eriocarpa. Italian Corn-Salad. Very similar to *V. Locusta* var. *olitoria* but with lvs. to 5 in. long, and flattened frs. surmounted by truncate calyx-limb. S. Eu.

Locusta var. olitoria (*V. olitoria*). Corn-Salad. To 1 ft.: st.- lvs. spatulate or oblong, to 3 in. long, toothed or entire: fls. light blue: fr. nearly spherical with 2-pointed beak. Eu.

olitoria: *V. Locusta* var.

VALERIANOIDES: *Stachytarpheta.*

VALLARIS. *Apocynaceæ.* Woody vines with milky juice, opposite lvs., and salver-shaped fls. in axillary clusters; trop. Asia and Malaya, one grown in S. Fla. as a tall veranda and arbor cover.

dichotoma: *V. Heynii.*

Heynii (*V. dichotoma*). Tall climbing: lvs. oval to linear-oblong, to 4 in. long, strongly pinnately veined: fls. creamy-white or greenish-white, fragrant, ⅔ in. across, the tube shorter than lobes, Dec.–Apr. India.

VALLISNERIA. Eel-Grass. Tape-Grass. *Hydrocharitaceæ.* Submerged aquatic per. herbs with linear lvs., staminate fls. on a short stalk or practically sessile near base of plant and pistillate on long spirally coiled scapes and coming to surface; occasionally grown in aquaria. Propagated by cuttings.

americana. Formerly included in *V. spiralis* and differing chiefly in the longer and more slender scape of the staminate fl. and the smaller spathe. Me. to Fla. and Miss.

spiralis. Lvs. from 6 in. to 6 ft. long and 1/12–⅓ in. wide: staminate fls. on short club-shaped scapes; pistillate fls. white. S. Eu., W. Asia.—The plant known to the trade as "Italian type" is probably *V. spiralis*, and is said to grow all winter while *V. americana* does not and is not hardy.

VALOTTA. *Amaryllidaceæ.* One S. African bulb grown in the greenhouse. **V. speciosa** (*V.* and *Amaryllis purpurea*). Scarborough-Lily. Lvs. to 2 ft. long and 1 in. wide, with fls.: fls. scarlet, funnelform, to 3 in. across, in umbels terminating a hollow scape to 3 ft. high; summer and autumn. Var. **alba** has white fls.—The bulbs should be kept somewhat moist even during the resting period. The roots should be interfered with as little as possible and plants may be kept in the same pots several years if liquid manure is applied. Repotting should be done after flowering is over.

VALVE: a separable part of a pod; the units or pieces into which a capsule splits or divides in dehiscing.

VANCOUVERIA. *Berberidaceæ.* Per. herbs of W. N. Amer., having creeping rootstocks, ternately compound lvs. and small drooping fls. in panicles on leafless scapes; grown in the border in rich soil.

hexandra. To 1½ ft.: lfts. ovate, to 1½ in. long, thin: fls. white, ½ in. long. Wash. to Calif., in forests.

VANDA. *Orchidaceæ.* Epiphytic orchids with leafy sts. and fls. in axillary racemes, the sepals and petals similar and spreading, the lip 3-lobed, spurred or saccate, united with foot of column. See *Orchids* for cult.

Amesiana. Sts. short: lvs. linear, to 8 in. long: fls. 1½ in. across, in 15–30-fld. racemes to 20 in. high; sepals and petals white; lip rose edged with white, Jan.–Feb. Cambodia, Siam.

Batemanni: *Vandopsis lissochiloides.*

Boxalli: *V. lamellata* var.

cærulea. To 2 ft.: lvs. to 10 in. long and 1 in. wide: fls. light blue, to 4 in. across, in 7–15-fld. racemes to 1½ ft. high, Oct.–Dec. Himalayas. Hort. forms are var. **albescens** with white fls. and blue lip, and **Roehrsiana** with pinkish fls.

cærulescens. To 2 ft.: lvs. to 7 in. long: fls. lilac with 3 dark blue crests, 1½ in. across, in many-fld. racemes to 16 in. high, Mar.–May. Burma.

cristata. Lvs. to 5 in. long and ½ in. wide: fls. with greenish-yellow sepals and petals and yellow lip striped with dark brown and saccate at base, Dec.–Feb. Himalayas.

Denisoniana. Lvs. to 1 ft. long and ¾ in. wide: fls. white with yellow spot at base of lip, 2 in. across, in 4–6-fld. racemes to 5½ in. long, Apr.–May. Burma.

densiflora: *Anota densiflora.*

Kimballiana. Sts. to 6 in.: lvs. to 10 in. long, cylindrical: fls. 2 in. across, in drooping racemes to 1 ft. long; sepals and petals white, wavy; lip dark rose with yellow side lobes spotted with red, Sept.–Nov. Burma.

lamellata. To 1½ ft.: lvs. to 1 ft. long: fls. 1½ in. across, in 5–12-fld. racemes to 1 ft. long; sepals and petals yellow spotted with brown; lip white, Nov.–Dec. Philippines. Var. **Boxalli** has whitish sepals and petals and rose lip.

Lowei: *Arachnis Lowei.*

luzonica. Fls. with white sepals and petals marked with purple and rose-purple lip and white spur. Philippines.

Parishii (*Vandopsis Parishii*). St. short: lvs. to 10 in. long and 2½ in. wide: fls. to 2½ in. across, the sepals and petals greenish-yellow spotted with brown, the lip bright yellow spotted with rose, in 5–7-fld. racemes to 14 in. long, July–Aug. India. Var. **Mariottiana** has rose fls. tipped with brown and white in center.

Roxburghii: *V. tesselata.*

Sanderiana: *Euanthe Sanderiana.*

suavis: *V. tricolor* var.

teres. To 8 ft.: lvs. to 8 in. long: fls. 4 in. across, in 3–5-fld. racemes to 1 ft. long; lateral sepals nearly white, dorsal sepal and petals violet; lip rose, yellow at base spotted with red, May–June. Himalayas. Var. **Andersoni** has larger brighter colored fls.

tesselata (*V. Roxburghii*). To 2 ft.: lvs. to 8 in. long: fls. 2 in. across, in 6–8-fld. racemes; sepals and petals yellowish netted with brown; lip with white lateral lobes spotted with red, and violet-brown midlobe, Nov. Ceylon, India.

tricolor. To 3 ft.: lvs. to 1½ ft. long and 1½ in. wide: fls. fragrant, 2 in. across, in 8–10-fld. racemes to 11 in. long; sepals and petals yellow spotted with brown, wavy; lip violet striped with purple, the lateral lobes white, Oct.–Jan. Java. Var. **suavis** has white sepals and petals spotted with purple and lip deep purple at base.

violacea: *Anota violacea.*

VANDOPSIS. *Orchidaceæ.* Orchids with the habit of Vanda but differing in having the lip joined with the column and keeled along the middle; for cult. see *Orchids.*

lissochiloides (*Vanda Batemanni*). Sts. to 4 ft. high: lvs. to 20 in. long and 2 in. wide: fls. 3 in. across, in 10–20-fld. racemes; sepals and petals yellowish thickly spotted with purple, violet outside; lip violet, yellow at base, June–July. Philippines.

Lowei: *Arachnis Lowei.*

Parishii: *Vanda Parishii.*

VANIERIA. *Moraceæ.* Woody plants native from China to Australia, having alternate simple lvs., unisexual fls. in axillary heads, and fr. a fleshy syncarp; planted for ornament in the S. and the lvs. fed to silkworms in China. Propagated by cuttings of young wood under glass in summer.

tricuspidata (*Cudrania tricuspidata*). To 25 ft. or more, armed with slender thorns: lvs. ovate, to 3 in. long, sometimes 3-lobed at tip: fr. red, nearly globose, 1 in. across. China, Korea, Japan.

VANILLA. *Orchidaceæ.* Climbing orchids with large fls. in axillary racemes or spikes, the sepals and petals similar, the lip with claw united to base of column; grown for ornament and also for the seed-pods which yield the vanilla of commerce. For cult. see *Orchids.*

aromatica: a name of doubtful botanical standing, possibly referable to *V. fragrans.*

fragrans (*V. planifolia*). COMMON VANILLA. Lvs. to 8 in. long and 2 in. wide: fls. greenish-yellow, 4 in. across, in many-fld. racemes, July–Aug. Trop. Amer.

planifolia: *V. fragrans.*

VANILLA, CAROLINA: *Trilisa odoratissima.*

VARIETY. A group or class of plants subordinate to a species. Thus, *Lycopersicon esculentum,* tomato, is a species in nature; a race or form is described as var. (variety) *cerasiforme.* It is essential to clearness in speaking or writing about plants to keep these categories distinct, yet they are commonly not carefully recognized and here arises one of the causes of confusion in nomenclature. To speak of all kinds of plants as different varieties, which is a prevailing popular practice, is failure to understand the subject.

There are two classes or ranges of varieties, —those displaying rather marked differences in nature, and those presenting only small more or less temporary or artificial differences useful to the gardener. The former class is entitled to Latin botanical names, as *Rosa carolina* var. *glandulosa,* whereas the horticultural varieties of roses mostly (and properly) receive vernacular names. What constitutes a variety is a question of personal opinion or judgment; but to name such a variation as if it were a species (as *Salvia compacta* rather than *S. splendens* var. *compacta*) is to introduce confusion in the identities of plants; and clear identification is an essential to the best horticulture.

VARNERIA AUGUSTA: *Gardenia jasminoides.*

VARNISH-TREE: *Aleurites moluccana, Rhus verniciflua.*

VEGETABLE-GARDENING is that branch or department of horticulture that is concerned with the growing of oleraceous or esculent herbs, or of the class of cultivated plants known by custom and tradition as "vegetables". Its formal or Latin equivalent is the term olericulture. The terms are impossible of close definition because the plants that fall within their scope are so various. The best definition is an enumeration of the plants. These plants are prevailingly annual, the marked exceptions being asparagus and rhubarb and also some of the sweet herbs. There are several kinds of vegetable-gardening, as home- or kitchen-gardening, market-gardening, truck-gardening. See *Market-Gardening.*

VEGETABLE MARROW: a form of *Cucurbita Pepo*; see *Pumpkin.* **-Oyster:** *Tragopogon-porrifolius.*

VEITCHIA. *Palmaceæ.* Four monœcious unarmed feather-palms from Fiji and the New Hebrides, one of which is sometimes grown under glass and may be possible in S. Fla.: trunk closely ringed: spadices at apex of trunk or base of long lf.-column, short and branched, the lower fls. pistillate; stamens 6: fr. large, ellipsoid or ovoid, with terminal stigmatic point, the exterior fibrous. For cult. see *Palm.*

Joannis (*Kentia Joannis*). Tall tree with single trunk and crown suggesting Dictyosperma: lvs. arching, several ft. long; pinnæ 80–100, close together and drooping, 2¼ in. or less broad, strongly many-nerved, oblique or truncate and somewhat toothed at apex: fr. long-cartridge-shaped and narrowed at apex, 2 in. long. Fiji.

VELTHEIMIA. *Liliaceæ.* Three S. African bulbous herbs with basal lvs. and tubular drooping fls. in dense terminal racemes; rarely grown but of easy cult.; spring and summer.

viridifolia. Lvs. to 1 ft. long and 3 in. wide: fls. yellow or tinged with red, 1½ in. long, in racemes to 6 in. long on stalks 1½ ft. high.

VELVET-PLANT: *Gynura aurantiaca.*

VENATION: veining; arrangement or disposition of veins.

VENIDIUM. *Compositæ.* S. African herbaceous annuals or perennials, with solitary heads of ray- and disk-fls.; pappus none or of scales.

Venidiums are usually treated as annuals, but sometimes grown as perennials under glass. Propagated by seeds sown under glass and transplanted.

calendulaceum: *V. decurrens.*

decurrens (*V. calendulaceum*). Spreading tomentose per. with sts. to 2 ft. long: lvs. mostly lyrate, the terminal lobe to 1½ in. long: heads golden-yellow with dark center, to 2½ in. across.

fastuosum. Ann. to 1½ ft. or more, cobwebby when young: lvs. irregularly lobed or nearly lyrate, to 3½ in. long: fls. bright orange with dark purple-brown base, to 4 in. across.

XVI. Vegetable-garden. — A good crop and an abundant harvest of peas for the home garden

VENTRAL: front; relating to the anterior or inner face or part of an organ; opposite the back or dorsal part.

VENUS FLY-TRAP: *Dionæa muscipula.* Hair: *Adiantum Capillus-Veneris.* Looking-Glass: *Specularia Speculum-Veneris.*

VEPRIS. *Rutaceæ.* Trees or shrubs native in Mauritius, Bourbon and S. Afr., with alternate lvs. of 3 lfts., small unisexual fls. in terminal panicles, and drupaceous fr.; grown out-of-doors in warm regions and under glass in the N. Propagated by cuttings over heat, and by seeds when available.

lanceolata (*Toddalia lanceolata. Boscia undulata*). Shrub or small tree: lfts. oblong-lanceolate, to 2½ in. long and narrow, wavy margined: fls. white: fr. size of pea.

VERATRUM. False Hellebore. *Liliaceæ.* Stout per. herbs with thick rootstocks, broad clasping lvs. and polygamous whitish, greenish or purplish fls. in terminal panicles; sometimes planted in the border or wild-garden. Of easy cult. and hardy. Propagated by division and seeds.

album. European White H. To 4 ft.: lvs. to 1 ft. long and 6 in. wide: fls. greenish outside, whitish inside, wavy-toothed, in panicles to 2 ft. long. Eu., N. Asia.

californicum. To 6 ft.: lvs. to 20 in. long and 8 in. wide, narrower toward top of plant: fls. white marked with green, to ¾ in. long, in panicles to 1½ ft. long. Wash. to Lower Calif.

nigrum. To 4 ft.: lvs. to 1 ft. long and 8 in. wide: fls. blackish-purple, in narrow panicles. Eu., Asia.

speciosum. To 6 ft.: lvs. to 1 ft. long and 8 in. wide, soft-pubescent beneath: fls. yellowish-white, ⅓ in. long. Wash. to Mont. and Calif.

tenuipetalum. To 9 ft.: lvs. to 1 ft. long and 8 in. wide: fls. yellowish-white. Colo.

viride. American White H. To 8 ft.: lvs. to 1 ft. long and 6 in. wide, narrower toward top: fls. yellowish-green, to 1 in. across, in panicles 2 ft. long. N. B. to Minn., south to Ga.

VERBASCUM. Mullein. *Scrophulariaceæ.* Usually tall erect hardy mostly bien. herbs, with alternate simple but sometimes pinnatifid lvs., yellow, tawny, red or purple, rarely white fls. in terminal racemes or spikes; native in Eu. and Asia, several nat. or escaped in N. Amer.

Several kinds are grown in the border where their columnar habit and gray-green foliage give a pleasing contrast. There are named garden kinds, said to be hybrids. Verbascum also hybridizes with Celsia. The species listed here are biennial, or so treated. Mulleins grow well in any soil except a cold wet one. Propagated by cuttings, division or by seed; they often self-sow freely, blooming the following year.

Blattaria. Moth M. To 6 ft., glabrous: lvs. to 2½ in. long, toothed or cut: fls. yellow with lilac throat, 1 in. across, the stamens lilac-pubescent, on solitary pedicels. Eu., Asia; nat. in N. Amer.

Chaixii. To 3 ft., white-tomentose: lvs. to 6 in. long, coarsely toothed: fls. yellow with purple-woolly stamens, pedicelled, the racemes panicled. S. Eu. Var. **album** has white fls.

crassifolium. To 4 ft., yellow-tomentose: lvs. to 8 in. long, toothed: fls. yellow, the stamens glabrous, in clusters in the raceme. Portugal.

densiflorum: *V. thapsiforme.*

floccosum: *V. pulverulentum.*

leianthum. To 14 ft., densely white-tomentose: basal lvs. to 4 ft. long and 2 ft. across, st.-lvs. smaller, coarsely toothed: fls. bright yellow, ¾ in. across, clustered in panicled racemes to 7 ft. long, the stamens woolly. Asia Minor.

Libani: a hort. form to 5 ft. high, with large yellow fls.

longifolium. To 4 ft., white- or yellowish-tomentose: lower lvs. to 2 ft. long, wavy: fls. golden-yellow, 1 in. across, pedicelled, in densely-fld. racemes 1 ft. long, longer stamens glabrous. S. Eu. Var. **pannosum** (*V. pannosum*) is more woolly and the fls. usually larger.

nigrum (*V. vernale*). To 3 ft.: lvs. green above, tomentose beneath: fls. small, yellow with purple throat, clustered in the raceme, the stamens violet-woolly. Eu., Asia. Var. **album** has white fls.

olympicum. To 5 ft., densely white-tomentose: lvs. entire, to 6 in. long: fls. 1 in. across, bright yellow, clustered in very long many-fld. racemes, stamens white-woolly. Greece.

pannosum: *V. longifolium* var.

phœniceum. Purple M. To 5 ft.: lvs. glabrous above, pubescent beneath, toothed: fls. purple or red, in a simple slender raceme, nearly glabrous, stamens purple-woolly. S. E. Eu., Asia.

pulverulentum (*V. floccosum*). To 9 ft., loosely white-tomentose: lvs. mostly entire: fls. yellow, small, in clusters in panicled racemes, stamens white-woolly. Eu.

pyramidale. Hybrid between *V. speciosum* and *V. orientale:* to 4 ft., white-pilose: lvs. wrinkled, coarsely toothed: fls. small, yellow, in clusters, stamens white- or purple-woolly. Austria.

sinuatum. To 3 ft., yellow- or gray-tomentose: lower lvs. deeply cut, upper lvs. entire: fls. yellow or rarely white, small, in nearly sessile clusters in panicled racemes, the stamens purple-woolly. Medit. region.

thapsiforme (*V. densiflorum*). To 5 ft., densely yellowish-tomentose: lvs. toothed: fls. yellow, in sessile clusters in a long spike. Eu.

Thapsus. Common M. To 6 ft., yellowish-tomentose: lvs. to 1 ft. long, toothed, soft: fls. yellow, 1 in. across, in sessile clusters in dense erect spikes, 2 lower stamens glabrous. Eu., Asia; extensively nat. in N. Amer. in old dry fields.

vernale: *V. nigrum.*

virgatum. To 4 ft.: lvs. to 3 in. long or the lower to 1 ft., toothed or lobed, pubescent and green: fls. yellow or white, 1 in. across, in short-stalked clusters, the stamens purple-woolly. Eu.; nat. in W. N. Amer.

Wiedemannianum. To 3 ft., woolly: lvs. to 5 in. long, toothed: fls. blue or purplish-lilac, to 1¼ in. across, the pedicels solitary, stamens purple-woolly. Caucasus.

Willmottiæ: hort. name.

VERBENA. *Verbenaceæ.* Hort. mostly per. herbs prized in the flower-garden for their profuse continuous bloom, and other species, some of which are somewhat shrubby and some ann., not in cult., probably 100 species in all, and all but *V. officinalis* native in Amer. The lvs. in the garden kinds are opposite, toothed, lobed or divided: fls. pink, red, lilac, white, in mostly rather broad corymb-like clusters that usually soon elongate into spikes, corolla tubular and salverform.

The plants are treated as annuals in the North, the seeds being started under glass in the window and planted out to 1 foot or so apart; or they may be propagated by cuttings from over-wintered plants. The common garden verbenas are hardy in the open in the southernmost states and give early and brilliant bloom in spring. Verbenas need open sunny exposure. The named verbenas of Teas are reputed hybrids between the common garden verbena (*V. teucrioides*) and the moss verbena (*V. pulchella*).

There are wild native verbenas in many parts of the United States and Canada but they are rarely known as cultivated subjects, except forms of *V. canadensis.* Many of them are erect weedy plants with small not showy flowers in close mostly long spikes. They are known as vervains.

Aubletia: *V. canadensis.*

bipinnatifida. More or less prostrate per. with ascending sts.: lvs. divided into narrow or linear parts: fls. lilac-purple, ½ in. or less across, in head-like clusters that soon elongate, the bracts as long as calyx.

S. D. to Mex. and Ariz.—A showy plant, sometimes transplanted.

bonariensis. One of the S. American ann. or per. vervains that is sometimes known as a cult. plant and has also run wild in the S.: to 4 ft., erect, branched, st. square: lvs. long and narrow, toothed: fls. lilac, in dense spikes 1½ in. or less long in clusters.

canadensis (*V. Aubletia. V. Drummondii. V. montana*). CLUMP V. Ascending and branching per. to 18 in.: lvs. 1–4 in. long, ovate-oblong, truncate or broadly cuneate at base, toothed and cut: fls. reddish-purple, lilac, rose, white, to ⅔ in. across, in an elongating head or spike, bracts shorter than calyx. Va. south and west.—Somewhat grown in gardens, in the N. as an ann.

chamædryfolia. Grown as an ann., more or less prostrate and rooting: lvs. 1–2 in. long, oblong or lance-oblong and pointed, rather sharply serrate or dentate and tapering at base, very scabrous: spike remaining rather short, on slender peduncle, fls. scarlet or crimson. S. Brazil, Uruguay, Peru.—Sometimes seen in botanic gardens.

ciliata. Per. or ann., depressed or low, to 10 in., pubescent: lvs. about 1 in. long, cut-lobed and cleft, petiole margined: fls. purple or bluish, ⅓ in. or less across, in lengthening clusters. W. Tex. to Colo. and Ariz., Mex.

dissecta: see *V. pulchella.*

Drummondii: *V. canadensis.*

erinoides: *V. laciniata;* see also *V. pulchella.*

hastata. Erect vervain, per., st. 4-sided, to 4–5 ft. or more: lvs. lanceolate or oblong-lanceolate, serrate or dentate, to 6 in. long: fls. small, blue, in narrow spikes. Weedy plant, N. S. across the continent and to Fla.

hispida. Per. vervain with erect or ascending rigid hispid st.: lvs. oblong or lanceolate, acuminate, sessile, sharp-serrate, sometimes 3-lobed or cut: fls. small, in long dense terminal spikes. Peru, Bolivia, Chile.

hortensis (*V. hybrida*). GARDEN V. Soft decumbent plant, more or less rooting, per. but mostly grown as ann.: lvs. soft to the hand, oblong to ovate-oblong, 2–4 in. long, broadened and truncate or truncate-cuneate at base, obtusely dentate, with short margined petiole: fls. in a broad corymb that lengthens in fr. to 2 or 3 in., pink, red, yellowish, white. Cultigen; commonly pronounced a multiple hybrid but this origin is undetermined; nearly allied to *V. teucrioides.*

hybrida: *V. hortensis.*

incisa. Erect, to 3 ft., pubescent, but weak: lvs. oblong with rather broad base, deeply lobed and cut with rather broad sinuses and lobes nearly obtuse: head or corymb remaining short, or not elongated, rose-crimson and mostly with an eye. S. Brazil, Paraguay, Argentina.—Perhaps sometimes cult.

laciniata (*V. erinoides*). Grown as an ann. but per. in mild climates, the branches decumbent and rooting, more or less hairy: lvs. ovate in general outline, deeply 3-parted and the divisions pinnatifid into narrow somewhat revolute lobes: fls. lilac, in short close often somewhat clover-like heads, the corolla bearded inside. Argentina, Chile.—See *V. pulchella.*

Mahoneti, Maoneti: supposed to be a form of *V. tenera.*

montana: *V. canadensis.*

officinalis. Erect per. vervain, to 2 ft., rather stiff, wiry-branched above: lvs. oblong, pinnatifid or 3-parted or sometimes only coarsely toothed: fls. small, lilac, in a slender elongating spike. Eu., Asia, escaped in this country and weedy.—Sometimes cult. and once an object of superstition.

phlogiflora. Prostrate, with ascending ends: lvs. short, ovate-lanceolate, notched and toothed: fls. rosy or purple, in dense umbel-like clusters that do not elongate. S. Brazil, Uruguay.—Probably not in cult. with us.

pulchella. Per., somewhat woody at base, but grown often as ann. from seed, decumbent, rooting, somewhat hairy to nearly smooth, sts. to 20 in. long: lvs. dissected into linear acute lobes: fls. blue or lilac, in terminal rather dense heads that elongate in fr. S. S. Amer., and now widely nat.—This is apparently the plant commonly known as *V. erinoides* and sometimes as *V. dissecta* and *V. tenera.*

rigida (*V. venosa. V. bonariensis* var. *rigida*). Erect stiff per. vervain, 1–2 ft., simple or branched, st. 4-angled, making rhizomes: lvs. narrow-oblong and pointed, 2–3 in. long, sharply toothed: fls. purplish, in dense spikes 1–3 in. long. S. Brazil, Argentina, sometimes spontaneous in warm regions.—Blooms first year from seed.

stricta. Per. soft-pubescent vervain, strict and leafy, to 30 in. high: lvs. ovate to oblong, to 4 in. long, nearly sessile, sharp-serrate or cut: fls. purple, in long close spikes. Ont. to New Mex.

tenera. Somewhat shrubby at base and cespitose, sts. decumbent and rooting: lvs. laciniate-pinnatifid, more or less hairy: fls. purplish, in an elongating spike. S. Brazil and south.—Doubtfully in cult. with us; see *V. pulchella.*

teucrioides. Per., rooting at base but sts. ascending, hairy: lvs. ovate to oblong with triangular base, nearly or quite sessile, obtusely serrate, margins more or less revolute, glandular-pubescent above: fls. yellowish-white or pinkish, in elongating terminal spikes, fragrant. S. Brazil and southward, Peru, Chile.—Probably chief source of the common garden verbenas.

venosa: *V. rigida.*

VERBENACEÆ. VERVAIN FAMILY. About 70 genera of herbs, shrubs or trees in the tropics, subtropics and temperate zones, characterized by irregular bisexual fls. having 4–5-lobed calyx and corolla, 4 (rarely 2 or 5) stamens, superior 2–8-celled ovary, and fr. a drupe or berry or nutlets. The family furnishes many showy garden and greenhouse subjects, and Tectona yields the teak-wood of commerce: Amasonia, Baillonia, Callicarpa, Caryopteris, Citharexylum, Clerodendrum, Congea, Duranta, Gmelina, Holmskioldia, Lantana, Lippia, Oxera, Petrea, Premna, Rhaphithamnus, Siphonanthus, Stachytarpheta, Tectona, Verbena, Vitex.

VERBENA. LEMON-: *Lippia citriodora.* **Sand-:** *Abronia.*

VERBESINA. *Compositæ.* American herbs and shrubs with opposite or alternate lvs. and yellow, orange or white solitary or panicled heads, with or without ray-fls.; pappus of awns. Sometimes grown for ornament.

crocata. Shrub to 15 ft., the sts. 4-winged: lvs. opposite, ovate, to 9 in. long, the lower deeply pinnatifid: heads orange-red, about 1 in. across, without rays. Mex.

encelioides (*Ximenesia encelioides*). Ann. to 3 ft.: lvs. alternate, triangular-ovate, to 4 in. long, toothed, pale beneath: heads to 2 in. across, with golden-yellow rays. Fla. to Mex.

VERNONIA. IRONWEED. *Compositæ.* Herbaceous perennials or in the tropics shrubs and trees, with alternate lvs. and showy purple, pink or white heads of disk-fls. usually borne in terminal clusters in late summer and autumn; pappus of scales and bristles.

Vernonias are sometimes grown in the border or wild-garden. They are easily cultivated in any good rich soil. Increased usually by division; also by seeds and cuttings.

altissima (*V. maxima*). To 10 ft.: lvs. lanceolate, to 1 ft. long, finely toothed: heads purple, ½ in. across. N. Y. to Fla. and La.

arkansana: *V. crinita.*

Baldwinii. To 7 ft., tomentose: lvs. oblong to ovate-lanceolate, to 8 in. long, toothed: heads purple, ½ in. across. Mo. to Tex.

crinita (*V. arkansana*). To 12 ft.: lvs. linear-lanceolate, to 1 ft. long, finely toothed: heads purple, 1 in. across, pappus purplish. Mo. to Tex.

fasciculata. To 6 ft.: lvs. linear to lanceolate, to 6 in. long, toothed: heads crowded, purple, about ¼ in. across. Ohio to Tex.

maxima: *V. altissima.*

noveboracensis. To 9 ft.: lvs. oblong or lanceolate, to 10 in. long, finely toothed: heads deep purple, ½ in. across, pappus purplish. Mass. to N. C. and Miss.

prænalta: a name of doubtful application.

VERONICA. SPEEDWELL. *Scrophulariaceæ.* Ann. and per. herbs of wide distribution, with at least lower lvs. opposite or seldom whorled, small white or blue fls. in axillary or terminal racemes or sometimes solitary, and capsular frs. The New Zeal. shrubby evergreen kinds, much planted on the Pacific coast, are now referred to the genus Hebe and they should not be called Veronicas.

Speedwells are grown in the flower-garden and border and the low or dwarf kinds in the rock-garden. They are of easy culture in good soil. Propagated by seeds and division.

albicans: *Hebe albicans.*

Allionii. Per. with prostrate sts.: lvs. oblong, fine-toothed: fls. violet, in spike-like racemes. S. Eu.

alpina. Per. to 6 in.: lvs. oblong, to 1 in. long, entire or toothed: fls. blue or violet, in dense racemes. Eu., Asia, N. N. Amer.

amabilis: *Hebe amabilis.*

amethystina: *V. spuria.*

amplexicaulis: *Hebe amplexicaulis.*

Andersonii: *Hebe Andersonii.*

angustifolia: *Hebe angustifolia.*

anomala: *Hebe anomala.*

arguta. Per. with creeping rootstocks: lvs. ovate to ovate-lanceolate, to ¾ in. long, toothed: fls. small, in few-fld. racemes. Australia.

austriaca (*V. prenja*). Per. to 2 ft.: lvs. pinnately cut into oblong or linear segms.: fls. blue, large, in long racemes. S. E. Eu., Asia Minor.

Bachofenii. White-pubescent per. to 2 ft.: lvs. oblong, to 2 in. long, cordate at base, coarsely toothed: fls. blue, in long racemes. Hungary.

Balfouriana: *Hebe Balfouriana.*

Barkeri: *Hebe Barkeri.*

Beccabunga. EUROPEAN BROOKLIME. Per. with prostrate sts.: lvs. oval, toothed: fls. deep blue, rarely pink, small. Eu., N. Afr.

bellidioides (*V. Townsendi*). Hairy per. to 6 in.: lvs. obovate, slightly toothed: fls. bluish, in short few-fld. racemes. S. Eu.

Bollonsii: *Hebe Bollonsii.*

Bonarota. Per. to 6 in.: lvs. orbicular, to 1 in. long, or upper ones lanceolate, toothed or cut: fls. blue, ⅓ in. across, in spikes to 2 in. long. S. Eu.

Buchanani: *Hebe Buchanani.*

buxifolia: *Hebe buxifolia.*

candida: *V. incana.*

canescens. Per. with creeping matted sts. to 4 in. long: lvs. to 1/10 in. long, entire: fls. solitary, pale blue, ⅓ in. across. New Zeal.

carnea: *Hebe carnea.*

carnosula: *Hebe carnosula.*

catarractæ. Per. to 2 ft. or sometimes prostrate: lvs. lanceolate, to 4 in. long, coarsely toothed: fls. white or pink, in racemes to 9 in. long. New Zeal.

caucasica. Per. to 6 in., pubescent: lvs. 1–2-pinnately cut into oblong or linear segms.: fls. white veined with violet, in loose racemes. Caucasus.

Chamædrys. GERMANDER S. Per. to 1½ ft.: lvs. broad-ovate, to 1½ in. long, toothed: fls. blue, ⅓ in. across, in racemes to 6 in. long. Eu., Asia; nat. in N. Amer.

chathamica: *Hebe chathamica.*

Colensoi: *Hebe Colensoi.*

crassifolia: *V. spicata.*

cupressoides: *Hebe cupressoides.*

Darwiniana: *Hebe Darwiniana.*

decumbens: *Hebe decumbens.*

decussata: *Hebe elliptica.*

Dieffenbachii: *Hebe Dieffenbachii.*

diosmæfolia: *Hebe diosmæfolia.*

Dorrien-Smithii: *Hebe Dorrien-Smithii.*

elegans: *V. spuria* var.

elliptica: *Hebe elliptica.*

excelsa: *V. maritima.*

filiformis. Ann. or per., with prostrate rooting sts.: lvs. ovate, small: fls. blue, on thread-like stalks. Asia Minor.

formosa: *Hebe formosa.*

fruticans: *V. fruticulosa.*

fruticulosa (*V. saxatilis. V. fruticans*). Shrubby per. to 6 in., much branched: lvs. oblong, to ½ in. long, nearly entire: fls. blue or pale pink, in short racemes. Mts. of Eu. and Greenland.

gentianoides (*V. glabra*). Per. to 2 ft.: lvs. oblong-lanceolate, to 3 in. and more long, entire or slightly toothed: fls. pale blue veined with darker, in long loose racemes. S. E. Eu. Var. **stenophylla** has narrower lvs.

Gibbsii: *Hebe Gibbsii.*

gigantea: *Hebe gigantea.*

glabra: *V. gentianoides.*

gracillima: *Hebe gracillima.*

Grievei: a form of *V. fruticulosa* usually known to the trade as *V. saxatilis Grievei.*

Hookeriana (*V. nivalis*). Prostrate per. with sts. to 10 in. long: lvs. ovate, to ½ in. long, coarsely toothed, leathery and stiff: fls. purplish or white, in corymbose racemes. New Zeal.

Hulkeana: *Hebe Hulkeana.*

imperialis: a garden name for *Hebe speciosa.*

incana (*V. candida*). White-pubescent per. to 2 ft.: lvs. oblong or lanceolate, to 3 in. long, toothed: fls. blue, in racemes to 6 in. long. N. Asia, Russia.

lævis: *Hebe lævis.*

latifolia. Per. to 2 ft.: lvs. ovate, cordate at base, toothed: fls. blue or reddish, in panicled racemes. Eu.

latisepala: *Hebe macrocarpa* var. *latisepala.*

leiophylla: *Hebe leiophylla.*

Lewisii: *Hebe Lewisii.*

longifolia: *V. maritima.*

Lyallii. Per. with prostrate rooting sts. to 1½ ft. long: lvs. broad-ovate, to ½ in. long, coarsely toothed: fls. white veined with pink, ⅓ in. across, in racemes to 6 in. long. New Zeal.

macrantha: *Hebe macrantha.*

macrocarpa: *Hebe macrocarpa.*

macroura: *Hebe macroura.*

maritima (*V. longifolia. V. excelsa*). Per. to 2 ft.: lvs. lanceolate or oblong, to 4 in. long, toothed: fls. lilac, in dense racemes. Eu., Asia, nat. in E. N. Amer. Var. **subsessilis** (*V. subsessilis*) has larger deep blue fls. and nearly sessile lvs.

multifida. Per. with decumbent sts.: lvs. pinnately cut into linear segms.: fls. pale pink or blue. Asia.

nivalis: *V. Hookeriana.*

obovata: a name of uncertain application, perhaps a hybrid; properly belonging to genus Hebe.

obtusata: *Hebe obtusata.*

officinalis. Per. with prostrate or ascending sts. to 1½ ft. long: lvs. oblong, to 2 in. long, toothed: fls. pale blue, to ¼ in. across, in racemes much longer than lvs. Eu., Asia, N. Amer.

Olseni. Prostrate per.: lvs. ovate or orbicular, to ½ in. long, coarsely toothed, thick and leathery: fls. white veined with pink, in many-fld. racemes. New Zeal.

paniculata: *V. spuria.*

parviflora: *Hebe parviflora.*

pectinata. White-pubescent prostrate per.: lvs. obovate, ½ in. long, toothed or sometimes cut: fls. deep blue with white center, in many-fld. racemes. Asia Minor. Var. **rosea** has rose fls.

peduncularis. Per. with prostrate or ascending sts.: lvs. ovate or oblong, coarsely toothed or cut: fls. white veined with pink. Asia Minor.

persica: *V. Tournefortii.*

pimeleoides: *Hebe pimeleoides.*

pinguifolia: *Hebe pinguifolia.*

polita. Ann. with weak sts. to 10 in. long: lvs. oval, deeply toothed: fls. blue, ¼ in. across, solitary. Eu., N. Afr.; nat. in N. Amer.

prenja: *V. austriaca.*

procumbens: a name without botanical standing.

prostrata: *V. Teucrium* var.

rakaiensis: *Hebe rakaiensis.*

repens. Creeping moss-like per.: lvs. ovate, to ½ in. long, shining: fls. rose or bluish, in few-fld. racemes. Corsica. Var. **alba** has white fls.

rotundata: *Hebe rotundata.*

rupestris: hort. name, probably for a form of *V. Teucrium.*

rupicola: *Hebe rupicola.*

salicifolia: *Hebe salicifolia.*

saturejoides. Creeping per. to 3 in.: lvs. oblong, ⅓ in. long: fls. blue, in short dense racemes. Dalmatia.

saxatilis: *V. fruticulosa.*

speciosa: *Hebe speciosa.*

spicata (*V. crassifolia*). To 1½ ft.: lvs. lanceolate, to 2 in. long, toothed: fls. blue or pink, in long dense racemes. N. Eu., Asia. Var. **alba** has white fls.

spuria (*V. amethystina. V. paniculata*). Per. to 2 ft., densely pubescent: lvs. linear, 1 in. long, toothed above: fls. blue, in panicled racemes. S. E. Eu., S. Asia. Var. **elegans** (*V. elegans*) is more branched and pubescent.

stenophylla: *V. gentianoides* var.

subsessilis: *V. maritima* var.

Teucrium. Per. to 1½ ft., pubescent: lvs. oblong- or linear-lanceolate, coarsely toothed: fls. blue varying to rose and white, in long racemes. Eu., Asia. Var. **prostrata** (*V. prostrata*) is nearly prostrate.

Tournefortii (*V. persica*). Prostrate ann.: lvs. ovate, ¾ in. long, coarsely toothed: fls. blue, in axillary racemes. Eu., Asia; nat. in N. Amer.

Townsendi: *V. bellidioides.*

Townsoni: *Hebe Townsoni.*

Traversii: *Hebe Traversii.*

triphyllos. Ann., often prostrate, pubescent: lvs. palmately cut into 3–5 oblong segms.: fls. blue, in loose racemes. S. Eu., N. Afr.

vernicosa: *Hebe vernicosa.*

versicolor: a listed name, perhaps a hybrid.

virginica: *Veronicastrum virginicum.*

VERONICASTRUM. *Scrophulariaceæ.* One variable per. herb native from Vt. to Tex. **V. virginicum** (*Veronica virginica. Leptandra virginica*). Culvers-Root. To 7 ft.: lvs. mostly whorled, lanceolate, to 6 in. long and 1 in. across, toothed: fls. white or pale blue, ⅙ in. long, in racemes to 9 in. long.—Sometimes transplanted from the wild.

VERSCHAFFELTIA. *Palmaceæ.* One monœcious more or less armed tree with brace roots at base of trunk and large pinnate-ribbed lvs. not parted to rachis, native in the Seychelles in the Indian Ocean: spadix among lower lvs., drooping, spathes 3; fls. in 3's, spirally disposed on slender side branches, the middle one pistillate; stamens 6, on very short filaments: fr. globular, with hard shell, nearly or quite 1 in. diam.; seed grooved; albumen strongly ruminate. Probably too tender for open ground in U. S. **V. splendida.** To 80 ft., slender, when young the st., lf.-sheaths and petioles spiny but losing the spines with age: lvs. oval or obovate, cuneate at base, blade several ft. long, deeply bifid at apex and the sides cut deeply or nearly to midrib at base, strongly ribbed.

VERTICILLATE: whorled; arranged in a circle about the stem, as leaves, bracts, flowers.

VERTICORDIA. *Myrtaceæ.* Australian usually heath-like shrubs with mostly small opposite entire lvs. and fls. in corymbs, spikes or racemes, the calyx-lobes plumose and radiating; one species intro. in Calif.

densiflora. To 3 ft.: lvs. linear, to ½ in. long, cylindrical or 3-angled: fls. white or pink, to ⅙ in. long, petals fringed, in dense terminal corymbs.

VERVAIN: *Verbena.*

VESICARIA. Bladder-Pod. *Cruciferæ.* Per. herbs, as now defined, of Cent. Eu. and Medit. region, one grown for the large inflated pods or silicles as well as for the yellow fls. **V. utriculata.** To 1½ ft. high, somewhat woody at base: lvs. many and entire, the lowest obovate and crowded, upper lanceolate: pods subglobose, to about ½ in. diam., the thin dissepiment persistent.

VETCH: *Vicia.* **Crown**: *Coronilla varia.* **Kidney**: *Anthyllis Vulneraria.* **Milk**: *Astragalus.*

VETCHLING: *Lathyrus.*

VETIVER, VETIVERIA: *Anatherum zizanioides.*

VIBURNUM. *Caprifoliaceæ.* Shrubs or small trees with opposite simple deciduous or persistent lvs., small white or pinkish fls. in showy terminal panicles or umbel-like cymes, and fr. a 1-seeded drupe; native in Amer., Eu., and Asia. Some of the viburnums are known as haws.

Viburnums are amongst the most popular ornamental shrubs, and many of them assume attractive autumn colors; they make good bird refuges because of their autumn and winter fruits. They are deciduous unless otherwise stated. Most of the deciduous species are hardy as far north as New England. They are not particular as to soil. Propagated by stratified seeds, by hardwood cuttings or cuttings of green wood under glass, by layers and grafting. A few of the snowballs are forced in the greenhouse for early bloom.

acerifolium. Dockmackie. To 6 ft.: lvs. 3-lobed, maple-like, coarsely toothed, to 5 in. long: fls. white, in long-stalked cymes to 3 in. across, May–June: fr. purple-black. N. B. to N. C. and Minn.

affine. To 6 ft.: lvs. ovate, to 3 in. long, coarsely toothed: fls. white, in dense short-stalked cymes to 3 in. across, May–June: fr. bluish-black. Mo. Var. **hypomalacum** has lvs. densely pubescent beneath. Que. to Ga. and Ill.

alnifolium (*V. lantanoides*). Hobble-Bush. American Wayfaring-Tree. To 10 ft.: lvs. nearly orbicular, to 8 in. long, cordate at base, irregularly toothed: fls. white, in sessile cymes 5 in. across, the marginal fls. sterile and 1 in. across, May–June: fr. purple-black. N. B. to N. C. and Mich. Var. **præcox** flowers earlier.

americanum: *V. trilobum.*

betulifolium. To 12 ft.: lvs. ovate, to 3 in. long, toothed: fls. in short-stalked cymes 4 in. across, June–July: fr. red. China.

bitchiuense. Similar to *V. Carlesii* but more straggling, with smaller lvs. and cymes. Japan.

bracteatum. To 10 ft.: lvs. orbicular, to 5 in. long, wavy-toothed, cordate at base: fls. in cymes to 3 in. across, conspicuously bracted: fr. bluish-black. Ga.

buddleifolium. To 6 ft.: lvs. oblong-lanceolate, to 6 in. long, slightly toothed, gray-tomentose beneath: fls. in dense cymes 3 in. across: fr. black. China.

burejaeticum. To 15 ft.: lvs. ovate or oval, to 4 in. long, wavy-toothed: fls. white, in dense cymes 2 in. across, May: fr. bluish-black. Manchuria, China.

Canbyi: *V. pubescens* var.

Carlesii. To 5 ft.: lvs. ovate or oval, to 4 in. long, toothed, pubescent on both sides: fls. white, fragrant, in dense cymes to 3 in. across, Apr.–May: fr. blue-black. Korea.

cassinoides. Withe-Rod. To 12 ft.: lvs. ovate or oval, to 4 in. long, finely toothed: fls. white, in short-stalked cymes to 5 in. across, June–July: fr. blue-black. Newf. to N. C. and Minn.

cinnamomifolium. To 20 ft., evergreen: lvs. elliptic-oblong, to 5 in. long, nearly entire: cymes to 7 in. across: fr. blue-black. China.

corylifolium. Similar to *V. dilatatum* but distinguished by the long pubescence of petioles, infl. and young branchlets. China.

cylindricum. To 40 ft., evergreen: lvs. elliptic or oblong, to 7 in. long, entire or slightly toothed, waxy above: fls. white, in stalked cymes to 4½ in. across, July–Sept.: fr. black. China, Himalayas.

Davidi. To 3 ft., evergreen: lvs. elliptic, to 5½ in. long, slightly toothed, pale beneath: fls. white, in dense stalked cymes to 3 in. across, June: fr. blue. China.

dentatum. Arrow-Wood. To 15 ft.: lvs. orbicular or ovate, to 3 in. long, coarsely toothed: fls. white, in long-stalked cymes 3 in. across, May–June: fr. blue-black. N. B. to Ga. and Minn.

dilatatum. To 10 ft.: lvs. orbicular or ovate, to 5 in. long, coarsely toothed, hairy on both sides: fls. white, in stalked cymes to 5 in. across, May–June: fr. scarlet. Japan.

ellipticum. To 8 ft.: lvs. oval, to 3 in. long, coarsely toothed above middle: fls. in long-stalked cymes 2 in. across: fr. black. Wash. to Calif.

erosum. To 6 ft.: lvs. ovate, to 3 in. long, sharply toothed: fls. in loose cymes to 3 in. across, May–June: fr. red. Japan.

fœtidum. To 10 ft., semi-evergreen: lvs. obovate or oval, to 2½ in. long, toothed above middle: fls. in cymes to 3 in. across, June: fr. scarlet. Himalayas, China. Var. **rectangulum** (*V. rectangulum*) is taller with branches often drooping.

fragrans. To 10 ft.: lvs. oval, to 3 in. long, toothed, slightly pubescent: fls. white or pinkish, fragrant, in panicles 2 in. long, Apr.–May: fr. black or purple. China.

furcatum. Very similar to *V. alnifolium* but of more upright habit: lvs. narrower, finely serrate. Japan.

grandiflorum. To 6 ft.: lvs. oval-oblong, to 4 in. long: fls. in short dense panicles: fr. blue-black or purple. Himalayas.

Harryanum. To 10 ft., evergreen: lvs. orbicular-ovate or obovate, to 1 in. long, nearly entire: cymes to 1½ in. across: fr. black. China.

Henryi. To 10 ft., evergreen: lvs. oblong, to 5 in. long, toothed, shining above: fls. in broad panicles to 4 in. long, Aug.: fr. red turning black. China.

hupehense. To 6 ft.: lvs. ovate, to 3 in. long, coarsely toothed, pubescent on both sides: fls. in cymes 2 in. across, June: fr. red. China.

japonicum (*V. macrophyllum*). To 6 ft., evergreen: lvs. ovate, to 6 in. long, slightly toothed above middle, shining above: fls. white, fragrant, in short-stalked cymes to 4 in. across, June: fr. red. Japan.

lævigatum: *V. obovatum.*

Lantana. Wayfaring-Tree. To 15 ft.: lvs. ovate, to 5 in. long, finely toothed, pubescent on both sides: fls. white, in cymes to 4 in. across, May–June: fr. red turning black. Eu., W. Asia. Var. **rugosum** has more wrinkled lvs.

lantanoides: *V. alnifolium.*

latifolium: *V. rigidum.*

Lentago. Sheep-Berry. Nanny-Berry. To 30 ft.: lvs. ovate, to 4 in. long, finely toothed: fls. white, in sessile cymes to 5 in. across, May–June: fr. blue-black, pruinose. Hudson Bay to Ga. and Miss.

lobophyllum. To 15 ft.: lvs. broad-ovate or obovate, to 4½ in. long, toothed, pubescent only on veins: fls. in long-stalked cymes to 4 in. across, June–July: fr. bright red. China.

lucidum: *V. Tinus* var.

macrocephalum. To 12 ft., semi-evergreen: lvs. ovate or oval, to 4 in. long, finely toothed, pubescent on both sides: fls. white, in stalked cymes to 5 in. across, the marginal ones sterile and 1 in. across, May–June. China. Var. **sterile,** Chinese Snowball, has all fls. sterile, forming a globose ball to 8 in. across.

macrophyllum: *V. japonicum.*

molle. To 12 ft.: lvs. nearly orbicular, to 5 in. long, cordate at base, coarsely toothed, pale and pubescent beneath: fls. white, in long-stalked cymes to 3 in. across, June: fr. blue-black. Ia. to Ky. and Mo.

nudum. Smooth Withe-Rod. To 15 ft.: lvs. ovate to oval-lanceolate, to 5 in. long, nearly entire, pubescent beneath: fls. white or yellowish, in long-stalked cymes to 5 in. across, June–July: fr. blue-black. L. I. to Fla. and La.

obovatum (*V. lævigatum*). To 8 ft., semi-evergreen: lvs. obovate, to 1½ in. long, nearly entire, shining and leathery: fls. white, in sessile cymes 2 in. across, Apr.–June: fr. black. Va. to Fla.

odoratissimum. To 10 ft., evergreen: lvs. oval, to 6 in. long, nearly entire, shining above: fls. white, fragrant, in panicles 4 in. high, May–June: fr. red turning black. India to Japan. Var. **nanum,** a dwarf form, and var. **variegatum** with variegated foliage, are listed.

Opulus. European Cranberry-Bush. To 12 ft.: lvs. 3–5-lobed, maple-like, to 4 in. long, pubescent beneath: fls. white, in stalked cymes to 4 in. across, the marginal fls. sterile and ¾ in. across, May–June: fr. scarlet. Eu., N. Afr., N. Asia. Var. **nanum** is a very dwarf form with small lvs. Var. **roseum** (var. *sterile*), Snowball, Guelder-Rose, has all fls. sterile and forming a round rose-like head. Var. **xanthocarpum** has yellow fr.—See *V. trilobum.*

ovatifolium. Shrub: lvs. ovate or oblong-ovate, to 3 in. long, toothed: fls. in cymes 3 in. across. China.

Oxycoccus: *V. trilobum.*

pauciflorum. To 5 ft.: lvs. nearly orbicular, to 3 in. long, 3-lobed at apex, toothed: fls. in heads 1 in. across, May: fr. red. N. N. Amer., N. E. Asia.

propinquum. Evergreen, with shining red-brown branchlets: lvs. elliptic to ovate-lanceolate, to 3½ in. long, slightly toothed, shining above: fls. greenish-white, in stalked cymes to 2½ in. across: fr. black. China.

prunifolium. Black-Haw. To 15 ft.: lvs. ovate or broad-oval, to 3 in. long, finely toothed: fls. white, in sessile cymes to 4 in. across, Apr.–May: fr. blue-black, pruinose. Conn. to Fla. and Tex.

pubescens (*V. venosum*). To 10 ft.: lvs. ovate to nearly orbicular, to 4 in. long, coarsely toothed, pubescent beneath: fls. white, in long-stalked cymes to 4 in. across, June–July: fr. blue-black. Mass. to Va. Var. **Canbyi** has larger wider lvs. Var. **longifolium** (*V. dentatum* var. *longifolium*) has longer narrower lvs.

rectangulum: *V. fœtidum* var.

rhytidophyllum. To 10 ft., evergreen: lvs. ovate-oblong, to 7 in. long, nearly entire, shining and deeply wrinkled above, gray- or yellow-tomentose beneath: fls. yellowish-white, in cymes to 8 in. across, May–June: fr. red turning black. China.

rigidum (*V. latifolium*). To 6 ft.: lvs. ovate or ovate-oblong, to 6 in. long, wrinkled above, pubescent beneath: fls. white, in cymes 4 in. across, May–July: fr. bluish-black. Canary Isls.

robustum: listed name.

rufidulum (*V. rufotomentosum*). Southern Black-Haw. To 30 ft.: lvs. oval, to 4 in. long, finely toothed, shining above, rusty-tomentose beneath: fls. white, in cymes 5 in. across, May-June: fr. dark blue, pruinose. Va. to Fla. and Tex.

rufotomentosum: *V. rufidulum.*

Sargenti. To 12 ft.: lvs. 3-lobed or sometimes oblong-lanceolate and unlobed, 4 in. or more long: fls. in long-stalked cymes to 4 in. across, the marginal fls. sterile and 1 in. across, May–June: fr. scarlet. N. E. Asia.

Sieboldii. To 10 ft.: lvs. oval or obovate, to 6 in. long, coarsely toothed, shining above, paler and pubescent beneath: fls. creamy-white, in panicles 4 in. long, May–June: fr. pink turning blue-black. Japan.

suspensum. To 6 ft., evergreen: lvs. oval, to 4 in. long, toothed toward apex, shining above, paler beneath: fls. pinkish, in dense panicles 1½ in. across, June–July: fr. red. Liu-Kiu Isl.

theiferum. To 12 ft.: lvs. ovate-oblong, to 5 in. long, slightly toothed, dark green above: fls. in stalked cymes 2 in. across, May–June: fr. red. China.

Tinus. Laurestinus. To 10 ft., evergreen: lvs. ovate-oblong or oblong, to 3 in. long, entire, dark green above: fls. white or pinkish, in cymes 3 in. across, in summer, often flowered in greenhouse: fr. black. Medit. region. A few of the hort. vars. are **hirtum** with lvs. pubescent beneath, **lucidum** (*V. lucidum*) with larger lvs., **strictum** of more upright habit, and **variegatum** with variegated lvs.

tomentosum. To 10 ft.: lvs. ovate, to 4 in. long, toothed, pubescent beneath: fls. white, in long-stalked cymes to 4 in. across, the marginal fls. sterile and 1 in. or more across, May–June: fr. red turning blue-black. Japan, China. Var. **lanceatum** has narrower lvs., var. **Mariesii** larger sterile fls. and cymes, var. **parvifolium** lvs. to 2 in. long, and var. **rotundifolium** broader lvs. and blooms earlier. Var. **sterile** (var. *plenum*, var. *plicatum*), Japanese Snowball, has all sterile fls. in round heads.

trilobum (*V. americanum. V. Oxycoccus*). Cranberry-Bush. To 12 ft.: lvs. broad-ovate, to 5 in. long, 3-lobed and coarsely toothed: fls. white, in short-stalked cymes to 4 in. across, the marginal fls. sterile, May–June: fr. scarlet. N. N. Amer.—The American representative of *V. Opulus*, and formerly not distinguished from it.

utile. To 6 ft., evergreen: lvs. ovate to oblong, to 3 in. long, entire, shining above, whitish-tomentose beneath: fls. white, in dense cymes to 3 in. across, May: fr. bluish-black. China.

Veitchii. To 6 ft.: lvs. ovate, to 5 in. long, slightly toothed, densely pubescent beneath: fls. white, in dense cymes to 5 in. across, May–June: fr. red turning black. China.

venosum: *V. pubescens.*

Wrightii. To 10 ft.: lvs. broad-ovate, to 6 in. long, coarsely toothed: fls. white, in short-stalked cymes 4 in. across, May–June: fr. red. Japan.

VICIA. Vetch. *Leguminosæ.* Herbaceous mostly tendril-climbing vines with pinnate lvs., papilionaceous fls., and flat pods; several species are grown for food, forage and green-manure crops and a few for ornament.

Seeds of vetches used for cover-crops (as *V. sativa* and *V. villosa*) are sown broadcast; those of *V. Faba* in drills 21 to 35 inches apart. Vetches are not particular as to soil.

americana. Per., with trailing or climbing sts. to 3 ft. long: lfts. elliptic or oblong: fls. purplish, in few-fld. racemes: pods to 1¼ in. long. N. Amer.

angustifolia. Ann. or bien.: lfts. linear-oblong: fls. purplish, usually 2 in the axils: pods black, to 3 in. long. Eu.

atropurpurea. Purple V. Ann., white-hairy: lfts. linear-oblong: fls. purple, white at base, in racemes: pods to 1½ in. long, pubescent, S. Eu.

calcarata. Ann.: lfts. linear-lanceolate: fls. purplish, solitary: pods 1½ in. long. Medit. region.

Cracca. Cow V. Per.: lfts. linear to oblong: fls. purplish, varying to white, in one-sided many-fld. racemes: pods to 1 in. long. Eu., Asia, N. Amer. Var. **Gerardi** is more pubescent, has more lfts. and violet fls.

Ervilia. Ervil. Bitter V. Ann., erect, 2 ft. or more, without tendrils: lfts. linear: fls. rose-colored, 2–4 in the axils: pods to 1 in. long. S. Eu.

Faba. Broad Bean. Horse Bean. Ann., erect, to 6 ft., without tendrils: lfts. oval to oblong: fls. white with purple blotch, solitary or several in the axils: pods sometimes to 1 ft. long. N. Afr., S. W. Asia.—Grown for forage, also for human food; the bean of history.

Gerardi: *V. Cracca* var.

gigantea. Per., climbing to several ft.: lfts. narrow-oblong: fls. reddish-purple, in racemes: pods 1½ in. long. Calif. to Alaska.

hirsuta. Ann., sts. to 3 ft., hairy: lfts. ovate to lanceolate: fls. white or pale blue, in 1–6-fld. clusters: pods ⅓ in. long. Eu., N. Afr., Asia.

hybrida. Ann.: lfts. obovate: fls. pale yellow striped with violet, solitary. Medit. region.—Probably some of the material cult. under this name belongs to other species.

narbonensis. Narbonne V. Ann.: lfts. oval to oblong: fls. purplish, solitary or few in the axils: pods to 2 in. long. S. Eu.

onobrychioides. Ann.: lfts. linear: fls. purplish turning to yellow, several in loose clusters: pods 1 in. or more long. S. Eu.

oroboides (*Orobus lathyroides*). Per. to 2 ft., without tendrils: lfts. ovate to oblong: fls. whitish or yellow, 3–7 in the axils: pods to 1½ in. long. S. Eu.

Pseudo-cracca. Ann.: fls. purplish with yellowish wings, in short racemes: pods to 1¼ in. long. S. Eu.

rosea: probably *Lathyrus rosea.*

sativa. Common or Spring V. Tare. Ann. or bien.: lfts. oblong: fls. purplish, usually 2 in the axils: pods to 3 in. long. Eu.; nat. in N. Amer. Var. **alba** has white fls., var. **fulgens** scarlet fls. and var. **macrocarpa** large fls. and seeds.

semicincta. Per., sts. to 4 ft.: lfts. linear: fls. blue-purple, in dense racemes: pods ¾ in. long. Calif., S. Ore.

verna: probably *Lathyrus vernus.*

villosa. Hairy or Winter V. Ann. or bien.: lfts. linear-oblong: fls. violet-blue, in long one-sided racemes: pods to 1 in. long. Eu., Asia.

VICTORIA. *Nymphæaceæ.* Large per. aquatics with erect rhizomes, very prickly: lvs. large, circular, with great bars and cross ribs beneath filled with air spaces, the margins turned up straight 3–8 in.: fls. fragrant, floating, 6–18 in. across when spread, opening late in the afternoon and remaining till the second day, changing from white to pink and even red: fr. a large more or less berry-like body: probably 3 species in S. Amer., sometimes grown in large aquaria.

Under cultivation in temperate regions victorias are treated as annuals, and require the same treatment as tender nympheas. They are raised from seeds, those of *V. regia* requiring a water temperature of 85–90° for germination, and *V. Cruziana* 65–70°. They are sown in February or March in pots or seed-pans that are set in shallow water. The young seedlings are transferred to small pots and kept growing continuously until transferred to their permanent quarters in tanks. If grown outside in the summer, steam pipes through the water keep this at the correct temperature till the season is warm enough.

Cruziana (*V. Trickeri*). Santa Cruz Water-Lily. Lvs. densely soft-hairy beneath, the upturned margins green, 6–8 in. high: fls. turning deep red-pink second day; sepals prickly only at base. Paraguay.—This is the species usually grown in this country.

regia. Royal Water-Lily. Lvs. 3–6 ft. across, in the larger forms turned up 2–4 in. at the edges, reddish beneath: fls. turning dull crimson second day; sepals prickly. British Guiana and Amazon. Var. **Randii**, the usual form in cult., has lf.-rim 5–6 in. and under side deeper red, fls. turning deep crimson.

Trickeri: *V. Cruziana.*

VIGNA. *Leguminosæ.* Herbs with 3-foliolate lvs., yellowish-white or purplish papilionaceous fls. usually in pairs at the ends of long peduncles, and long slender cylindrical pods.

Several species are grown for food, forage and as green-manure and cover-crops, *V. sinensis* being one of the staple crops of the South. Adapted only to mild climates, as southern United States and susceptible to frost. Grown as annuals from seed planted as soon as land is warm in spring.

Catjang. Catjang. Pods short, 3–5 in. long, erect or spreading. Probably Asia.

lutea: *V. marina.*

marina (*V. lutea*). Pods 2 in. long, reflexed. Trop. seashores.

sesquipedalis (*Dolichos sesquipedalis*). Asparagus Bean. Yard-long Bean. Pods 1–3 ft. long, hanging, flabby or somewhat inflated when green. Probably Asia.

sinensis. Cowpea. Pods 8–12 in. long, hanging. Probably Asia.—Grown for forage, green-manure, the beans also for human food.

VILLARESIA. *Icacinaceæ.* Evergreen trees and shrubs native in the southern hemisphere, having alternate lvs., white fls. in small head-like cymes, and fr. a drupe; one species is cult. in Calif. Propagated by cuttings.

mucronata. Tree to 40 ft. or more: lvs. ovate to oblong, to 3 in. long, entire, shining above, pale beneath: fls. yellowish-white, ¼ in. long, in cymes to 2 in. long: fr. about ½ in. long. Chile.

VILLOUS: provided with long and soft, not matted, hairs; soft-shaggy.

VINCA. PERIWINKLE. *Apocynaceæ.* Trailing or erect herbs, sometimes shrubby and evergreen, with opposite firm lvs., solitary axillary salverform fls., and fr. of 2 spreading follicles; native in the Old World, several planted for ornament and ground-cover; useful for vases and baskets.

The common periwinkle thrives in moist shady locations. It and *V. major* are propagated by division and cuttings. *V. rosea* is grown from seeds as an annual, or propagated by cuttings from carried-over plants.

alpina: a listed name.

Harrisoni: a listed name for a plant of the *V. major* kind.

herbacea. Trailing: lvs. elliptic or lanceolate: fls. purplish-blue, 1 in. across. E. Eu., Asia Minor.

major. Trailing, evergreen: lvs. ovate, truncate or heart-shaped at base: fls. blue, 1–2 in. across. Eu. Var. **variegata** has lvs. variegated.

minor. COMMON P. RUNNING-MYRTLE. Trailing, evergreen: lvs. oblong to ovate, narrowed at base: fls. lilac-blue, varying to white and purple as indicated by the names **alba, atropurpurea, cærulea, purpurea,** to ¾ in. across. Eu.; run wild in E. U. S. There are variegated (var. **variegata** and **aureo-variegata**) and double-fld. forms (var. **plena**).

rosea (*Ammocallis* and *Lochnera rosea*). MADAGASCAR P. Per. but commonly grown as an ann. in the N., to 2 ft., erect: lvs. oblong: fls. rosy-purple or white (var. **alba**), to 1½ in. across, showy, everblooming. Tropics.—Useful as a flower-garden ann. in the N.

VINCETOXICUM. *Asclepiadaceæ.* Herbaceous American twining vines with opposite heart-shaped lvs., small wheel-shaped deeply-parted fls. in axillary clusters, the crown joined to corolla, and thick milkweed-like smooth or warty frs.; rarely transplanted from the wild. The plants referred to Vincetoxicum in the Old World are regarded as better treated under Cynanchum.

acuminatum: *Cynanchum acuminatifolium.*

hirsutum. Hairy or downy: lvs. ovate-acuminate, to 7 in. long and 5 in. broad: fls. crimson-purple, about ½ in. long: fr. warty. Md. to Fla.

japonicum: *Cynanchum acuminatifolium.*

suberosum. Plant glabrous or pubescent: lvs. oval or ovate and acute or abruptly pointed, to 5 in. long and 3 in. wide: fls. brown-purple, ¼ in. long, May–July: fr. not warty. Va. to Fla.

VINE: *Vitis.*

VIOLA. VIOLET. *Violaceæ.* Herbaceous perennials, rarely subshrubs, stemless or with leafy sts., a very few ann.: stipules persistent and often leafy: fls., in many species, of two kinds, those in early spring showy and non-fertile, those in summer cleistogamous, apetalous and producing numerous seeds; showy fls. nodding, the lower petal spurred while the other 4 are in two unlike pairs: caps. dehiscing into 3 boat-shaped and keeled valves: native in north and south temp. zones, many species suitable for the rock- and wild-garden and as edging plants in semi-shady positions in the border.

Nearly all violas thrive best in partial shade and fairly rich soil. They require plenty of moisture and a winter covering of leaves or evergreen boughs. The violets may be grown from seeds sown in autumn in boxes and exposed to freezing, germination then taking place in spring. A quicker method of propagation is by division or by runners when such are produced. The florists violet is usually increased by offsets in late winter or early spring, rooting these in sand. Sometimes the old plants are divided when they are lifted in spring but care must be exercised not to save hard or weak material.

Pansy is a viola. In this country the pansy is usually propagated by seed which should be sown from the middle of July to the middle of August for the next spring bloom. The plants may be wintered over in coldframes or in milder sections they may be planted in permanent quarters if covered with a mulch preferably of leaves; the crowns should not be covered too thickly or the plants smother. If desired, the seed may be sown indoors in late winter. In the case of named varieties or special colors cuttings should be used or layers, as the seed is too hybrid in character. Pansies are normally perennial but some races are essentially annual as to horticultural treatment or at least biennial inasmuch as they are supposed to give their best bloom when relatively young; they are sometimes classed with biennials, although the plants may persist and with good care bloom for a number of years. It is well to have a new stock coming on each year from seed; and if one wants choice flowers careful attention must be given to the securing of well-bred strains and the seeds of such kinds are necessarily expensive. Pansies thrive in a cool rather moist soil, and although they may benefit by some protection from the noonday sun they should not be planted in shade. As the ground becomes warm a mulch of leaf-mold or other light material may be spread over the bed to retain moisture and exclude heat. Spring and fall give the best bloom, but with attention to these details and to watering and not allowing seeds to form or long weak growths to choke the bed, good pansies may be had all summer; by pruning and otherwise the plants should be kept stocky and compact; do not grow too thickly,—say 8 inches apart each way. Seeds sown in boxes in January or February make blooming plants by April, taking the place of those blooming earlier from over-wintered stock.

adunca (*V. canina* var. *adunca*). Sts. to 4 in. long: lvs. round-ovate, slightly toothed: fls. violet turning red-purple. Alaska to Calif.

arenaria. To 3 in.: lvs. ovate, small: fls. pale violet or white. S. Eu.

atropurpurea: an unidentified name for a purple-fld. violet.

Beckwithii. To 4 in.: lvs. palmately 3 times 3-parted into linear segms.: fls. with 2 upper petals purple and 3 lower pale violet. Ore. to Calif. and Nev.

bellidifolia. Dwarf, matted: lvs. broad-ovate, obtuse, glabrous: fls. violet or purple. Mont. to Ida.

biflora. Lvs. reniform, toothed, glabrous: fls. small, yellow, lip streaked with blackish-purple, spur very short. Eu., Siberia.

blanda. SWEET WHITE V. Lvs. ovate, acute, somewhat hairy on the upper surface: fls. white with narrow strongly reflexed petals. Que. to Ga. and La.

bosniaca: *V. elegantula.*

calcarata. To 4 in., with creeping rootstocks: lvs. ovate to lanceolate, wavy-toothed: fls. violet, the spur as long as corolla. Eu.

canadensis. To 1 ft. or more: lvs. broad-ovate, cordate, acute, toothed: fls. white inside with yellow base, outside often tinged violet. N. B. to Ala. and Ariz.

canina. DOG V. Lvs. ovate-cordate, toothed: fls. bluish-purple with yellow spur. Eu.

cenisia. Lvs. ovate, entire: fls. violet. Alps of Eu.

chærophylloides: a confused name; perhaps a form of *V. pinnata.*

chrysantha: *V. Douglasii.*

conspersa. To 6 in.: lower lvs. cordate-orbicular, toothed: fls. many, pale violet varying to white, spur short. Que. to Minn. and Ga.

cordata: name of uncertain application.

cornuta. Horned V. Per. more or less tufted: lvs. ovate, wavy-toothed, stipules large, triangular, coarsely toothed: fls. violet, spur slender, as long as calyx. Spain and Pyrenees.—The Tufted or Bedding pansies are probably an offshoot of this species, with shorter spurs. Garden vars. are **admirabilis**, possibly a hybrid form; **alba**, fls. white; **lutea splendens**, fls. golden-yellow; **Papilio**, fls. very large, violet with purple center; **purpurea**, fls. purple.

cucullata. Lvs. broad-ovate, acute, wavy-toothed: fls. violet with darker throat, sometimes white. Que. to Ga.

cuneata. Sts. to 7 in. long: lvs. ovate, toothed: fls. with 2 upper petals purple, lower violet or whitish veined or spotted with purple, spur yellowish. Ore., Calif.

Douglasii (*V. chrysantha*). To 5 in.: lvs. bipinnate into linear or oblong segms.: fls. orange-yellow veined with purple, the 2 upper brownish-purple outside. Calif.

elegantula (*V. bosniaca*). Per. but better treated as bien., to 6 in., becoming straggling: lvs. ovate, wavy-toothed: fls. rose-purple with yellow striped spot at base of lower petal, long-spurred. S. W. Eu.

florariensis. Recorded as a hybrid with *V. rothomagensis* and *V. cornuta:* fls. purple, the lower petal yellow at base striped purple, short-spurred.

glabella. To 1 ft.: lvs. cordate: fls. bright yellow veined with purple, short-spurred. Alaska to Calif.

gracilis. To 1 ft., hairy: lvs. oblong to broad-ovate, somewhat toothed, stipules pinnately parted: fls. violet, spur longer than sepals. Macedonia to Asia Minor. Var. **alba**, fls. white. Var. **lutea**, fls. yellow.

Hallii. To 4 in.: lvs. palmately 2-parted into narrow segms.: fls. with 2 upper petals dark violet and 3 lower yellow or white. Ore., Calif.

hastata. To 10 in.: lvs. halberd-shaped, toothed: fls. yellow tinged violet outside. Pa. to Fla.

hederacea (*Erpetion reniforme*). Australian V. Tufted, creeping by stolons: lvs. reniform to spatulate, entire or toothed: fls. blue varying to white, scarcely spurred. Australia.

hirta. Similar to *V. odorata*, hairy, 6 in.: lvs. narrower and more triangular: fls. inodorous or faintly scented, spur long and hooked. Eu.

Howellii. To 1 ft., erect or spreading: lvs. ovate-cordate or round-reniform, toothed and ciliate: fls. pale blue or violet, large, spur straight, about half length of sepals. Ore.

Langsdorffii. To 8 in.: lvs. ovate-cordate, wavy-toothed: fls. blue or violet varying to white, spur broad. N. W. Amer., Siberia.

linearifolia: *Ionidium linearifolium.*

lobata. To 1 ft.: lvs. palmately 3–7-parted into nearly entire lobes: fls. yellow veined at base, purple outside. Ore., Calif.

lutea. To 10 in., with creeping underground sts.: lvs. ovate to lanceolate, wavy-toothed, stipules pinnatifid: fls. yellow, sometimes upper petals or fls. purple, spur as long as calyx. Eu.

missouriensis. Tufted, to 6 in.: lvs. ovate-cordate, toothed: fls. pale violet marked with purple, white center. Mo. to Tex.

Munbyana. To 1 ft.: lvs. cordate-ovate, toothed, glabrous, stipules pinnately cut: fls. large, 1–3 from the lower axils, violet or yellow, spur straight, about twice length of sepals. Algeria.

nephrophylla. Lvs. cordate-ovate or reniform, wavy-toothed: fls. deep violet, large. Cold bogs, N. N. Amer.

nummularifolia. Tufted alpine: lvs. broad-ovate, entire: fls. blue with darker lines, short-spurred. S. Eu.

Nuttallii. To 10 in.: lvs. lanceolate, tapering into margined petioles, entire or nearly so: fls. yellow. Man. to Ariz.

ocellata. To 1 ft.: lvs. cordate-ovate, wavy-toothed: fls. with 2 upper petals white, violet on outside, the 3 lower white or yellow spotted or veined with purple. Ore., Calif.

odorata. Sweet, Garden or Florists V. Tufted, stemless, making long runners: lvs. cordate-ovate to reniform, toothed: fls. deep violet, rarely rose or white, fragrant, spur short, nearly straight. Eu., Afr., Asia.—Many forms varying in stature, size and color of fls., also vars. with double fls. Var. **sulfurea**, fls. sulfur-yellow.

palmata. Lvs. palmately 5–11-lobed or -parted, middle segm. largest, toothed or cut: fls. violet-purple. Mass. to Minn. and Fla.

palustris. Lvs. cordate-ovate or reniform, wavy-toothed: fls. pale lilac with darker veins, varying to nearly white, short-spurred. Moist soil, N. N. Amer., Eu., Asia.

papilionacea. Robust, to 6 in.: lvs. deltoid-ovate to cordate-ovate, toothed: fls. normally deep violet with whitish or greenish-yellow center; cleistogamous fls. usually underground. Mass. to Ga. and Okla.

pedata (*V. pedata* var. *bicolor*). Birds-foot V. Stemless: lvs. 3–5-divided, segms. 2–4-cleft or toothed near apex: fls. with 2 upper petals dark violet, 3 lower pale lilac. Mass. and Minn. to Fla.

pedatifida. Lvs. palmately many-parted, the ultimate segms. linear: fls. violet, on scapes longer than lvs. Ohio to Ariz.

pedunculata. Sts. ascending, often 2 ft. long: lvs. round-ovate, coarsely toothed: fls. orange-yellow veined purple on the inside. Calif.

pinnata. Stemless, to 3 in.: lvs. palmately many-parted: fls. violet, paler at base. Eu.

præmorsa. To 10 in.: lvs. oblong-ovate or ovate-lanceolate, nearly entire: fls. yellow tinged brown or purple. B. C. to Rocky Mts.

primulifolia. To 10 in.: lvs. oblong to ovate, somewhat toothed: fls. white with purplish veins. N. B. to Fla. and La.

pubescens. To 1 ft., soft-pubescent: lvs. broad-ovate to reniform, toothed, stipules large: fls. bright yellow, spur short. N. S. to Va. and Mo.

Riviniana. To 6 in.: lvs. cordate-ovate, stipules lanceolate: fls. pale blue with short yellowish-white spur. Eu.

rostrata. To 8 in.: lvs. cordate-ovate or orbicular, toothed: fls. lilac with darker spots, spur to ½ in. long. Que. to Mich. and Ga.

rothomagensis: a form of *V. tricolor.*

rotundifolia. To 4 in.: lvs. oval, obtuse, thick and prostrate, round-toothed: fls. bright yellow, with brown lines on 3 lower petals. Mts. Me. to Ga.

rugulosa. To 2 ft., with branching stolons: lvs. cordate-reniform, hairy below: fls. white inside with yellow base, often tinged violet. Alaska to Iowa.

sagittata. Lvs. lanceolate or oblong-lanceolate, sagittately toothed at base: fls. violet-purple. Mass. to Ga. and La.

sarmentosa. Sts. decumbent: lvs. round-cordate, toothed, dark-spotted: fls. yellow, short-spurred. B. C. to Calif.

septentrionalis. To 5 in.: lvs. ovate to reniform, toothed and ciliate: fls. large, violet-purple, rarely white. Newf. to B. C.

Sheltonii. To 6 in.: lvs. palmately 3-parted into cut lobes: fls. pale yellow. Wash. to Calif.

sylvestris (*V. silvatica*). Sts. reclining and ascending, to 8 in.: lvs. deeply cordate or nearly reniform, stipules narrow, fringed-toothed: fls. bluish-purple or lilac, spur short. Eu.

tricolor var. **hortensis.** Pansy. Heartsease. Ann. or short-lived per., sts. becoming long and much branched: basal lvs. round-cordate, st.-lvs. ovate-oblong or lanceolate, toothed, large stipules pinnately parted near base: fls. large, usually in 3 colors, blue, whitish and yellow, spur short. The garden pansy is considered an offshoot of *V. tricolor*, probably with other species involved in its parentage; it varies greatly in size, shape and coloring of fls. See cult. at head of this article.

VIOLACEÆ. Violet Family. Widely distributed temp. and trop. herbs or shrubs, and sometimes trees, of 15 genera, having simple or deeply cut lvs., mostly bisexual irregular or regular fls. with 5 sepals and petals, the lower petal often spurred or saccate, 5 stamens, superior 1-celled ovary, and fr. a caps. or berry. Known to cult. with us in the genera Hymenanthera, Ionidium, Melicytus and Viola.

VIOLET: *Viola.* **African-:** *Saintpaulia ionantha.* **Dames-:** *Hesperis matronalis.* **Dogs-tooth-:** *Erythronium dens-canis.* **Usambara-:** *Saintpaulia ionantha.*

VIORNA: *Clematis.*

VIRGILIA. *Leguminosæ.* One S. African tree, intro. in S. Calif. **V. capensis.** Lvs. with 6–10 pairs of linear-oblong leathery lfts. to 1 in. long, pale and tomentose beneath: fls. papilionaceous, rosy-purple, ½ in. long, in terminal racemes: pods linear, flattened, leathery. For *V. lutea* see *Cladrastis.*

VIRGINIA CREEPER: *Parthenocissus quinquefolia.*

VIRGINS-BOWER: *Clematis.*

VISCARIA: *Lychnis.*

VISCUM: see *Loranthaceæ.*

VITACEÆ. Grape or Vine Family. Mostly woody vines climbing by tendrils, of 10 or more widely distributed genera, having alternate simple or compound lvs., small bisexual or unisexual fls. with 4–5 sepals, petals and stamens, superior 2–6-celled ovary, and fr. a berry. Several genera are grown for ornament and screens and covering arbors and walls, as Ampelopsis, Cissus, Leea, Parthenocissus, Vitis; and Vitis is grown also for the edible fr. The plants are of easy cult., and many of them are hardy in the northern states.

VITEX. *Verbenaceæ.* Trees or shrubs with opposite digitately compound lvs. and white, blue, yellowish or red fls. in terminal spikes or panicles in late summer and autumn.

Vitex does well in any good soil. Propagated by seeds in spring, layers and greenwood cuttings under glass. *V. Negundo* is usually root-hardy in some of the northern parts of the country, but *V. Agnus-castus* is more tender; when the roots survive, the young shoots produce flowers.

Agnus-castus. Chaste-Tree. Hemp-Tree. Monks Pepper-Tree. To 10 ft.: lvs. of 5–7 lanceolate nearly entire lfts. to 4 in. long, grayish-tomentose beneath and very dark green above: fls. lilac or lavender (varying to whitish), ⅓ in. long, in rather dense spikes to 7 in. long. S. Eu. Var. **alba** has white fls. Var. **latifolia** (*V. latifolia*) has shorter broader lvs.

divaricata. To 60 ft.: lvs. of 1 or 3 elliptic to ovate entire lfts. to 6 in. long: fls. violet or blue, to ¼ in. across, in panicles: fr. black, ⅓ in. long. W. Indies, Guiana.

laciniata: *V. Negundo* var. *incisa.*

latifolia: *V. Agnus-castus* var.

lucens. To 60 ft.: lvs. of 3–5 obovate lfts. to 5 in. long, glabrous and shining: fls. dark red, 1 in. long, in panicles: fr. bright red, ¾ in. across. New Zeal.

macrophylla of the trade is a broad-lvd. form of *V. Agnus-castus.*

Negundo. To 15 ft.: lvs. of 3–5 ovate to lanceolate toothed or entire lfts. to 4 in. long, grayish-tomentose beneath and dark green above: fls. lilac or lavender, ¼ in. long, on slender branches of loose panicles to 8 in. long. China, India. Var. **incisa** (*V. laciniata*) has deeply toothed or cut lvs.

VITIS. The Vine. Grape. *Vitaceæ.* Tendril-climbing woody deciduous vines of the northern hemisphere, grown for the fr. and also for screen cover, trellises and ornament: fls. (often unisexual) with a disk separate from the ovary; petals 5, coherent at the apex and falling together. Most of the cult. species are hardy in the middle or northern states; propagated readily by means of seeds, also by cuttings of ripe dormant wood, and rare kinds by soft cuttings in frames. See *Grape.*

acida: *Cissus acida.*

æstivalis. Summer G. Very tall vigorous climber: lvs. rusty-tomentose or cobwebby on under side of the large soft lobed lvs.: fr. ⅓ in. or less diam., glaucous-black. New England to Fla. and Kans.—Norton Virginia grape is supposed to be a derivative. Var. **Bourquiniana** has thinner lvs. and only slightly reddish tomentum and large black or amber fr.; represented in Herbemont and Lenoir grapes.

amurensis. Strong vine with the look of *V. cordifolia* but lvs. more or less 3-lobed and the basal sinus very broad and shallow: fr. about ⅓ in. across, black. Manchuria.—Grown for ornament, the lvs. highly colored in autumn.

antarctica: *Cissus antarctica.*

arizonica. Canyon G. Low, scarcely climbing, the tendrils mostly perishing if not attached to support, the internodes short: lvs. rather small, broad-ovate with wide open sinus, usually only indistinctly lobed if at all, cobwebby when young: fr. about ⅓ in. across, black. W. Tex. to Calif. and Mex.

Baileyana. Possum G. Slender high climber, densely foliaged: lvs. broad-ovate and cordate, mostly 3-lobed near apex, dull, at maturity pubescent on veins underneath: fr. ¼ in. or less diam., shining black. W. Va. to Ga.

Berlandieri. Spanish G. Stocky, moderately climbing: lvs. cordate, often as broad as long, angled or 3-lobed toward apex, shining above and at maturity pubescent on veins underneath: fr. ⅓ in. or less diam., purple. S. W. Tex. and Mex.

betulifolia. Birch G. Good climber: lvs. mostly rather small, ovate, shallow-cordate to almost truncate at base, mostly not lobed or only angled, pubescent underneath: fr. small, blue-black. China.

bicolor: *V. Leconteana.*

bipinnata: *Ampelopsis arborea.*

Bourquiniana: *V. æstivalis* var.

californica. Tall climber: lvs. roundish or reniform, cordate, pubescent or floccose underneath, some of them 3–5-lobed but commonly not so: fls. very fragrant: fr. about ⅓ in. diam., purple and very glaucous. Calif.

candicans. Mustang G. High strong climber, the young parts white-tomentose and lvs. (which are broad-ovate and lobed only on verdurous shoots) remaining so underneath: fr. to ¾ in. across, purplish. Ark., Okla., Tex.

capensis: *Cissus capensis.*

caribæa. Strong high vine: lvs. orbicular-ovate, cordate or truncate at base, apex short, not lobed, becoming dull above, rusty-tomentose underneath: fr. very small. Trop. Amer., doubtfully in U. S.

Champini. Robust climber: lvs. reniform to very broad-ovate, cobwebby or pubescent when young but becoming dark glossy green above, lower surface pale and at first tomentose: fr. about ½ in. diam., black. Tex.

cinerea. Sweet Winter G. Very high climber: lvs. large, broad-ovate, more or less 3-angled or -lobed, dull and dark green above at maturity, under surface cobwebby-pubescent: fr. ⅓ in. or less diam., black or purple without appreciable bloom. N. Fla. to Tex., north to Ill. and Kans.

Ciotat: see *V. vinifera.*

Coignetiæ: *V. Kaempferi.*

cordifolia. Frost G. Very large high climber: lvs. broad-ovate, the cordate sinus narrow, mostly not lobed, shining above, paler underneath but becoming glabrous except perhaps on veins: fr. ⅓ in. or less diam., dull black. Pa. to Fla., Kans. and Tex.

Davidi (*Spinovitis Davidi*). Vigorous prickly climber: lvs. large and rugose, broad-ovate, more or less angled or obscurely lobed toward apex, dull green above and glaucous underneath: fr. about ½ in. across, black. China.

Doaniana. Vigorous climber: lvs. medium size, very broad-ovate and cordate, sometimes shouldered, floccose above but becoming glabrous, tomentose underneath: fr. ½ in. or more diam., black with bloom. Okla. to N. Mex.—Promising as parent of vineyard vars.; hardy in northern states.

flexuosa. Slender graceful climber: lvs. rather small, broad-ovate with broad sinus or nearly truncate, shouldered or 3-lobed, shining above and pubescent on veins underneath: fr. about ⅓ in. across, black. Japan, China.—An Ampelopsis is sometimes grown under this name.

Girdiana. High climber: differs from *V. californica* in having young parts densely white-tomentose, lvs. cordate-ovate and pointed and more tomentose or arachnoid underneath, large forked fl.-cluster, fr. smaller and scarcely, if at all, glaucous. S. Calif., often near the sea.

gongylodes: *Cissus gongylodes.*

heterophylla: *Ampelopsis brevipedunculata* var. *Maximowiczii.*

himalayana: *Parthenocissus himalayana.*

humulifolia: *Ampelopsis humulifolia.*

hypoglauca: *Cissus hypoglauca.*

incisa: *Cissus incisa.*

indivisa: *Ampelopsis cordata.*

Kaempferi (*V. Coignetiæ*). Very strong heavy-foliaged vine, brightly coloring in autumn: lvs. large (sometimes 1 ft. across), cordate-orbicular, sinus narrow, often shouldered or shallowly lobed, dull above and gray- or rusty-tomentose underneath: fr. about ⅓ in. diam., black with bloom. Japan.

Labrusca. Fox G. Strong climber with intermittent tendrils: lvs. large and thick, broadly cordate-ovate and often obscurely 3-lobed toward apex, upper surface dull, under surface dull whitish or rusty-tomentose: frs. few in a cluster, ¾ in. or less diam., purple-black with strong foxy flavor. New England and N. Y. to Ga.; also in botanic gardens.

Labruscana. Labruscan Grapes. Vineyard vars. (as Concord) showing strong Labrusca likeness and derivatives or hybrids from it: lvs. mostly thinner, less rusty-tomentose: frs. in heavy pointed or shouldered clusters, larger and ameliorated in flavor. Cultigen.

laciniosa: *V. vinifera* var. *apiifolia.*

Leconteana (*V. bicolor*). Blue G. Much like *V. æstivalis*, differing particularly in lvs. more or less glaucous underneath and glabrous and absence of rusty wool on young growths, and frs. not running as large. New England to Ont. and Mich. and south to Va. and perhaps farther.

Linsecomii. Post-Oak G. Much like *V. æstivalis* but a more stocky grower, lvs. larger and densely tomentose underneath and frequently not rusty: fr. larger, sometimes 1 in. diam., black or dark purple and with thin bloom. S. W. Mo. to La. and Tex.—Promising as parent of vineyard grapes.

Longii (*V. Solonis*). Bush G. Stocky, more or less bushy and erect: young parts floccose: lvs. broad-cordate to nearly orbicular. very coarsely dentate, becoming glossy above at maturity, under surface pale and pubescent on nerves: fr. ½ in. or less diam., black and glaucous. Okla., N. Tex. and N. Mex., S. Colo.

megalophylla: *Ampelopsis megalophylla.*

micans: *Ampelopsis micans.*

monticola. Sweet Mountain G. Slender climber: lvs. rather small, nearly orbicular or reniform, the sinus open or shallow, sometimes somewhat 3-lobed, shining light green above and below: fr. ½ in. or less diam., black with little or no bloom. Tex.

Munsoniana. Bird G. A muscadine grape, differing from *V. rotundifolia* in being a more slender grower, continuously flowering or fruiting, lvs. less pointed, fr. smaller with thinner skin and tender pulp and lacking the strong flavor. S. Fla.; likely to be planted or utilized in its region.

novæ-angliæ. Strong vine native Me. to E. N. Y. and Conn., probably not cult. outside botanical collections but which is to be distinguished from *V. vulpina:* lvs. round or reniform-ovate, only obscurely or shallowly lobed, the teeth less prolonged, more pubescent underneath: fr. nearly ¾ in. or less diam., black-purple and glaucous.

oblonga: *Cissus oblonga.*

orientalis: *Ampelopsis orientalis.*

Pagnuccii: *V. Piasezkii* var.

palmata: *V. rubra.*

pentagona. Climber, with young branches tomentose: lvs. ovate, nearly or quite truncate at base, obscurely angled, gray- or reddish-tomentose underneath: fr. about ¼ in. diam., in a long cluster. China; hardy in S. New England.

Piasezkii. Climber with young sts. sometimes glandular: lvs. tomentose underneath, mostly deeply lobed or palmately compound with 3–5 narrow or lance-ovate lfts. with the lateral ones smaller: fr. about ⅓ in. diam., black with bloom. Var. **Pagnuccii** (*V. Pagnuccii*) has young branches and under surfaces of lvs. glabrous or nearly so. China; hardy in northern states.

pterophora: *Cissus gongylodes.*

pulchra. Strong handsome climber with reddish somewhat floccose young growth: lvs. large, becoming bronzy and glabrous above and purplish tomentose underneath to green, scarcely if at all lobed. Origin unknown; perhaps a hybrid. Hardy in S. New England.

quadrangularis: *Cissus quadrangularis.*

reticulata. High climber with young parts tomentose: lvs. broad-ovate, at first reddish, not lobed, becoming glabrous above, cobwebby on veins underneath and reticulate: fr. about ⅓ in. across, black and glaucous. China.

rhombifolia: *Cissus rhombifolia.*

riparia: *V. vulpina.*

Romaneti. Stout climber with shoots pubescent and glandular-hairy: lvs. large and thick, orbicular-ovate and indistinctly 3-lobed or shouldered, glabrous or nearly so above, tomentose underneath: fr. about ⅓ in. across, black. China; hardy in northern states.

rotundifolia (*Muscadinia rotundifolia*). Muscadine. Bullace G. Very strong climber with bark not shredding and tendrils simple: lvs. nearly orbicular to very broad-ovate, short-pointed, shining above, glabrous or essentially so underneath: fr. in small clusters, early deciduous, 1 in. or less diam., dull purple, skin thick and pulp strong-flavored. Del. to Fla., Kans. and Mex.—There are a number of vineyard vars., the Scuppernong having amber-green fr.

rubra (*V. palmata*). Red or Catbird G. Tall glabrous climber, the branchlets and petiole red: lvs. rather small, ovate and long-pointed, 3-lobed: fr. about ⅓ in. across, black. Ill. to Tex.; hardy N.

rupestris. Sand G. Bushy, sometimes somewhat climbing, glabrous, tendrils often absent: lvs. rather small, nearly or quite reniform, conduplicate, only slightly, if at all, lobed: fr. ½ in. or less diam., purple-black and lightly glaucous. S. Pa. and Mo. to Tenn. and Tex., and hardy when planted farther N.

sempervirens: see *Cissus striata.*

sinensis: hort. name; perhaps *V. Piasezkii.*

Solonis: *V. Longii.*

Thomsonii: *Parthenocissus Thomsonii.*

Thunbergii. Slender climber, young parts and under surface of lvs. rusty-tomentose: lvs. cordate-ovate, deeply 3–5-lobed mostly with rounded sinuses: fr. ⅓ in. or so diam., black and glaucous. China; hardy N.

vinifera. Wine G. The cult. grape of Eu. and of history and also of Calif., in many forms, moderately climbing: lvs. broadly cordate-ovate or nearly orbicular, rather thin, with deep narrow sinus, coarsely toothed, 3–5-lobed with narrow obtuse sinuses, glabrous both surfaces or sometimes tomentose underneath: fr. variable in size, form and color, the skin adhering to the pulp. Probably of the Caucasian region. Var. apiifolia (*V. laciniosa*) is a cut-lvd. form.—*V. Ciotat* is a cut-lvd. or compound-lvd. sport of the vineyard variety Chasselas Doré (of *V. vinifera*), but it has been confused apparently with *Ampelopsis aconitifolia.*

vulpina (*V. riparia*). Riverbank G. Vigorous climber, fragrant in bloom, glabrous except perhaps on veins on under surface of the broad-ovate rather thin large-toothed commonly 3-lobed pointed lvs.: fr. ½ in. or less diam., black and glaucous. N. S. to Man. and Tenn. and Tex.

VITTADINIA. *Compositæ.* Herbaceous perennials with thick rootstocks, alternate lvs., and heads in corymbs or solitary, of blue or white ray-fls. and yellow disk-fls.; pappus of bristles; distributed in Australia, New Zeal., S. Amer. and Hawaiian Isls. Closely related to Erigeron, differing in the slender-pointed rather than blunt or broad style-branches.

australis (*V. triloba*). Per. to 1 ft., woody at base, decumbent or nearly erect, not trailing, mostly pubescent: lvs. to ½ in. long or longer if very narrow, spatulate or linear, lobed or toothed at tip: heads solitary and terminal, with white rays. Australia, New Zeal. —Probably not in cult., the plant grown under this name being *Erigeron Karvinskianus*.

triloba: *V. australis*.

VOLADOR: *Triplaris americana*.

VOLKAMERIA: *Clerodendrum*.

VOLUTARELLA: *Amberboa*.

VOUACAPOUA AMERICANA: *Andira inermis*.

VRIESIA. *Bromeliaceæ.* Mostly epiphytic herbs native in trop. Amer., having stiff lvs. in dense rosettes and yellow, green, white or rose fls. covered with conspicuous bracts and borne in flattened spikes; grown also for the foliage which is often barred or variegated. For cult. see *Bromeliaceæ*.

Cappei. Hybrid of uncertain parentage.

Duchartrei. Hybrid, parentage unknown.

Duvaliana (*Tillandsia Duvaliana*). To 1 ft.: lvs. tinged with red beneath: fls. yellow tipped with green, with scarlet and green bracts. Brazil.

erecta. Hybrid betweem *V. Poelmani* and *V. Rex*.

fenestralis. To 1½ ft.: lvs. to 2 ft. long, dark-veined and tipped with brown: fls. pale yellow, bracts spotted green. Brazil.

hieroglyphica. Lvs. banded and irregularly marked with dark green above and brown-purple beneath: fls. yellowish. Brazil.

Magnisiana. Hybrid between *V. Barilleti* and *V. fenestralis*, having green lvs. with dark zigzag lines, to 16 in. long and 4 in. wide: fls. yellow, the bracts nerved with red, the infl. to 2½ ft. high.

nigrescens: perhaps the same as *Tillandsia nigrescens*.

picta: *V. splendens*.

Poelmani. Hybrid of uncertain origin.

Rex. Hybrid between *V. Morreni-Barilleti* and *V. cardinalis*, with carmine-red bracts.

Saundersi (*Encholirion Saundersi*). To 1½ ft.: lvs. linear, grayish above dotted with white, spotted with red-brown beneath: fls. yellow. Brazil.

splendens (*V. zebrina. V. picta*). To 3 ft.: lvs. to 1 ft. long and 3 in. wide, banded transversely with dark brown: fls. yellowish-white, the bracts bright red. Guiana. Var. major is a robust form.

zebrina: *V. splendens*.

W

WAHLENBERGIA (*Cervicina*). *Campanulaceæ.* Ann. or per. herbs of wide distribution, with mostly alternate simple lvs., blue bell-shaped or tubular, 5-lobed, nodding fls., and capsular fr.; grown in the rock-garden. Cult. as for *Campanula.* For other names see *Edraianthus.*

congesta. Per. with creeping sts.: lvs. orbicular or oblong, to 1 in. long, toothed: fls. pale blue, ⅓ in. across. New Zeal.

gracilis (*W. vincæflora*). Ann. to 1 ft.: lvs. linear-lanceolate, ½ in. long, toothed: fls. blue, ½ in. long, solitary on long stalks. New Zeal., Australia, S. Afr.

hederacea (*Campanula arvatica*). Ann. with creeping or ascending sts. to 10 in.: lvs. round-cordate, ½ in. across. 5–7-angled: fls. pale blue-lilac. Eu.

lobelioides: *W. pendula.*

pendula (*W. lobelioides*). Ann.: lvs. obovate to linear-lanceolate, toothed: fls. rosy-blue, small, scarcely exceeding the calyx, solitary on long stalks. Madeira, Canary Isls.

saxicola. Tufted ann. to 6 in.: lvs. obovate to linear, to 1 in. long: fls. white veined with blue, solitary. Tasmania.

vincæflora: *W. gracilis.*

WAHOO: *Euonymus atropurpureus.*

WALDSTEINIA. *Rosaceæ.* Per. strawberry-like creeping herbs of north temp. zone with mostly basal long-stalked 3–5-lobed or -divided lvs. and yellow fls. in corymbs borne on bracted scapes; sometimes planted in the rock-garden and of easy cult.

fragarioides. BARREN-STRAWBERRY. Lvs. of 3 wedge-shaped lfts. to 2 in. long, coarsely toothed at tips: fls. about ⅕ in. wide. Woods, N. B. to Ga. and Minn.

WALLFLOWER: *Cheiranthus Cheiri,* which see for cult. Beach: *Erysimum suffrutescens.* Coast: *Erysimum capitatum.*

WALLICHIA. *Palmaceæ.* Feather-palms, mostly soboliferous, unarmed, monœcious or polygamous, the pinnæ short and cuneate and variously toothed at the oblique or irregular apex; species about 4 in the Indo-Malayan region; they thrive in protected situations in S. Fla.: stemless or with short trunk; spadices among the lvs., much branched; stamens 6, borne on the corolla-tube: fr. ovoid-oblong, 1–3-seeded, ½–1 in. long, red or purple. See *Palm.*

caryotoides. Clustered palm, with sts. short or not evident: lvs. to 8 or 9 ft., curved or arching; pinnæ a dozen or more, oblong or narrow-oblong, white underneath, irregularly cut and toothed; petiole long and nearly cylindrical: fr. about 1 in. long. Bengal, Burma.

disticha. Trunk solitary or very few, 10–15 ft., coarsely ringed, the lvs. distichous (on two opposite sides) and 8–10 ft. long; pinnæ 1–2 ft. long and 2–3 in. broad, stiff and ribbed, somewhat glaucous underneath, narrow at base and truncate, obtuse or irregular at apex and toothed, with a jagged tooth or little lobe on either side about the middle; petiole short, obscurely angled: fr. oblong. Himalaya.

WALNUT (species of Juglans). The native black walnut of the eastern United States and Canada is *J. nigra,* often gathered from fields and roadsides for home use and market and to some extent planted for the nuts, as is also the butternut, *J. cinerea.* Farther west and in California are other native species of Juglans. Good edible nuts are produced by East Asian species. The walnut of history (the English or Persian walnut) is *Juglans regia,* in several marked forms, and this species is under discussion in the remainder of this article.

Various races of cultivated walnut thrive over a wide territory in North America. They may be grown in western New York with satisfaction. The commercial acreage, however, is in southern California, where adaptable varieties have been produced. Fertile deep and well-drained loams are desired, with dependable irrigation water. Trees may be set as close as 40 by 50 feet, but this is too near together for trees at maturity, 60 or 65 feet being preferable. Clean tillage is given from the first, with good cover-crop for winter or following fruiting; this crop is plowed under in spring. The trees are strong free growers on good land. The young tree may be pruned to the desired height for a trunk, but thereafter little regular pruning is undertaken except to thin out the poor, weak and crowding branches.

The crop may run as high as one ton of nuts to the acre, but much less than this quantity is the usual yield. The nuts are shaken off by means of long poles with hooks, but many of them fall naturally. They are washed, dried and sacked, and then taken to the central packing house to be bleached and graded for market. They are now marketed in small cartons for retail trade, under label or trade-mark, and each nut may also be stamped.

Formerly trees were grown directly from seed, but with the coming of improved named varieties grafting must be employed. The desired variety may be worked on common seedling stocks, or on seedlings of the wild California walnut or of the black walnut. The year-old seedling is grafted at the crown in the nursery in spring, the whip-graft method being usual, the parts being covered with wax. At one year from the graft the tree should be 6 feet or more tall, if the soil is good and it has been staked to prevent injury. This one-year-old tree (two-year root) is set in the orchard or grove. The tree is cut back to 5 or 6 feet, to form the head;

or if it is not strong or shapely enough it may be headed back to within a foot or two of the ground and a new sprout (which should be staked) is developed for the future bole. The walnut tree is long lived.

Insects and diseases are not particularly damaging; but the grower should be informed by the latest bulletins and reports.

WALTHERIA. *Sterculiaceæ.* Herbs, shrubs or trees native mostly in trop. Amer., with alternate toothed lvs. and small fls. in axillary clusters or cymes; one species sometimes grown in Fla.

americana. To 4 ft.: lvs. ovate to oblong, to 2 in. long: fls. yellow, about ¼ in. long, in dense clusters. Fla., W. Indies, S. Amer.

WAMPI: *Clausena punctata.*

WANDERING JEW: *Tradescantia fluminensis, Zebrina pendula.*

WAND-FLOWER: *Sparaxis.*

WARATAH: *Telopea speciosissima.*

WARNERIA AUGUSTA: *Gardenia jasminoides.*

WARSCEWICZELLA. *Orchidaceæ.* Epiphytes native in trop. Amer., without pseudobulbs and with large solitary fls., the sepals and petals similar, the 3–4-lobed lip united with foot of column; grown in a warm greenhouse. See *Orchids* for cult.

aromatica. Fls. fragrant, to 4 in. across, white with an azure lip. Panama, Costa Rica.

discolor. Lvs. to 10 in. long: fls. 2 in. across, on stalks to 5 in. long; sepals and petals white, the latter tinged with purple inside; lip purple edged with white and with yellow crests, May–June. Costa Rica, Guatemala.

Wendlandi. Lvs. to 10 in. long: fls. 2½ in. across, on stalks 4 in. long; sepals and petals yellowish-green; lip violet edged with white. Costa Rica.

WARSZEWICZIA. *Rubiaceæ.* Trop. American trees or shrubs with large opposite lvs. and small fls. in cymes borne in terminal panicles; one species intro. in S. Calif.

coccinea. To 20 ft.: lvs. obovate, to 2 ft. or more long and 1 ft. across: fls. yellow or orange, ¼ in. long, the infl. 1 ft. and more long. Trinidad, Cent. Amer. to Brazil.

WASHINGTONIA (*Neowashingtonia*). *Palmaceæ.* Two or 3 species of massive hermaphrodite fan-palms, native in Sonora and Lower Calif., Mex., and in the interior of S. Calif., and in S. W. Ariz., unarmed except for the spiny margins of petioles, the chaffy fls. solitary and nearly sessile on the branchlets of long and slender axillary spadices that exceed the foliage, the clusters of sprays looking not unlike corn-tassels: lvs. large and heavy: stamens 6, with narrow filaments: fr. a little 1-seeded thin-fleshed ellipsoid or globose drupe about ⅓ in. long. The Washingtonias are extensively planted in Cent. and S. Calif., and are common along the Gulf Coast, in Fla., as well as in other parts of the world. They are still sometimes listed as Brahea, a practice that should now be discontinued. For cult. see *Palm.* For another genus Washingtonia, see *Osmorhiza*, one of the *Umbelliferæ.*

filamentosa: *W. filifera.*

filifera (*Brahea filifera* and *filamentosa. W. filamentosa*). Ponderous tree to more than 80 ft., clothed in nature with a dense evenly thatched "petticoat" or shag of hanging old lvs. that usually tapers inward somewhat at the base when the lower trunk is bare and does not show any outstanding old fl.-stalks; lower lvs. hanging prone, displaying the long flat mostly green (except at base) spined petioles: lvs. very long-stalked and standing well separated so that the crown is open and very broad, the long limp narrowly-attenuate segms. of the very filiferous blades gracefully hanging. Native about streams and springs on borders of Colorado Desert, Calif.—Not so well adapted as the next species for planting near the coast.

gracilis: *W. robusta.*

robusta (*W. gracilis*). A taller and more slender tree than *W. filifera*, or more rapid-growing, clothed in nature with a long cylindrical uneven or ragged shag, and the old fl.-stalks standing out squarely through it, the rich brown and heavily spined petioles not prominent: crown relatively narrow: lvs. stiffer and mostly less deeply cut and less slender-pointed, bearing few or no fibers except on very young trees; segms. very variable as to their drooping habit and the number of filaments. Mex.—The shag or thatch sometimes falls from the upper part of the trunk of tall trees, leaving the st. bare.

Sonoræ. Described from Sonora, but little understood; if distinct from *W. robusta* apparently not much, if at all, planted in the U. S.

WASHINGTON PLANT: *Cabomba caroliniana.*

WATER-FEATHER: *Myriophyllum proserpinacoides.* **-Hawthorn:** *Aponogeton distachyus.* **-Hemlock:** *Cicuta.* **-Hyacinth:** *Eichhornia crassipes.* **-Leaf:** *Hydrophyllum.* **-Lily:** *Nymphæa.* **-Lettuce:** *Pistia Stratiotes.* **-Milfoil:** *Myriophyllum.* **-Plantain:** *Alisma.* **-Poppy:** *Hydrocleys nymphoides.* **-Shield:** *Brasenia, Cabomba.* **-Snowflake:** *Nymphoides indicum.* **–Soldier:** *Stratiotes.* **-Weed:** *Elodea canadensis.* **-Willow:** *Decodon verticillatus.*

WATERMELON (*Citrullus vulgaris*). The watermelon is of simple requirements, yet good commercial results are obtained only on quickly fertile land that has not raised the crop for three or four years or more. In home gardens long rotation cannot often be practised, but extra attention to fertility and to combatting of pests may overcome the deficiency. Good early varieties of excellent quality are available for home planting, and they should be more largely grown even in the northern states; these varieties are commonly less long-running than the commercial field varieties, and 8 feet apart each way is sufficient space to allow.

For general field culture the vine should have a running space of 10 feet between the hills. The crop requires a long warm season. Drainage should be good. Land is often plowed in autumn, to expose it to the comminuting action of frost. Well-rotted manure may be worked into the hill and soft earth placed on top in which the seeds are planted. Four or five plants may be left to the hill or stand. Horse cultivation should cease when the plants begin to run, so that the vines will not be disturbed. About twelve tons of merchantable melons to the acre is a good crop. Watermelon wilt is one of the troublesome diseases, for which rotation and care not to use contaminated manure and planting resistant varieties are preventives.

When a watermelon is ripe it gives a flat dead sound when thumped; the white under side turns yellowish and becomes rather hard and rough or pimply; the fruit has a yielding or "givey" feeling when pressed by the palm of the hand as it lies on the ground, but this test is likely to injure the melon for shipping.

The hard white-fleshed citron-melon, used for preserving, is grown the same as other forms of watermelon. See *Citrullus.*

WATERMELON, CHINESE: *Benincasa hispida.*

WATSONIA (*Meriana*). *Iridaceæ.* Strong summer-blooming bulbs from S. Afr., the sts. bearing sword-shaped lvs. and red or white fls. in terminal or lateral racemes, with curved perianth-tube and equal segms. Cult. as for *Gladiolus,* to which they are related but differ, among other things, in the character of the style. Popular in Calif. for summer bloom.

angusta. To 4 ft.: fls. scarlet, the segms. to 1 in. long and acuminate.

Ardernei: *W. iridifolia* var. *O'Brieni.*

Beatricis. St. to 3 ft.: lvs. few, linear: fls. rich apricot-red, corolla 2 in. or more long, limb wide open.

coccinea. To 1 ft.: fls. scarlet, the tube to 2 in. long and exceeding the spreading segms.

iridifolia. To 4 ft.: fls. pink, to 3 in. long, the tube much longer than segms. Var. **O'Brieni** (*W. Ardernei*) has pure white fls.

marginata. To 5 ft.: fls. rose-red, fragrant, differing from *W. rosea* in the funnel-shaped upper part of the tube being very small.

rosea. To 6 ft.: fls. rose-red, the tube broadened under segms. and of same length.

WATTLE: see *Acacia.*

WAXBERRY: *Symphoricarpos albus.*

WAX-PLANT: *Hoya carnosa.* —**Tree:** *Rhus succedanea.*

WAXWORK: *Celastrus scandens.*

WAYFARING-TREE: *Viburnum alnifolium* and *Lantana.*

WEDELIA. *Compositæ.* Many species of ann. and per. herbs in the warm parts of the world, erect to creeping, sometimes more or less woody: lvs. opposite, entire to lobed: heads mostly yellow-rayed and solitary or few together; pappus a crown.

trilobata (*Stemmodontia trilobata*). Trailing and rooting: lvs. elliptic, 2–4 in. long, more or less notched and shallowly lobed: heads yellow, erect on solitary pedicels. S. Fla. and trop. Amer.—Sometimes employed as ground-cover.

WEED: a plant that is not wanted and therefore to be destroyed. A plant desired under one circumstance, as horse-radish or vegetable-garden dandelion, may be a weed under other circumstances. Datura back of the barn is jimson-weed; in the drug-garden it is stramonium. Some plants are naturally weedy, by which it is meant that they invade habitable and cultivated grounds and make trouble: they are not wanted. Plants that do not make trouble excite no opposition and are not weeds even though they may have no "uses" in cookery, commerce, ornament or medicine. The primary remedy for weeds is to grow the plants that one wants: the better they are grown the less will be the opportunity for invaders; and if naturally weedy places are kept clean most of the breeding grounds will be eliminated; and clean seed may be sown. Aside from this, special practices may be necessary to circumvent and control some kinds of weeds under given conditions. The gardener and farmer will find these means.

WEIGELA. *Caprifoliaceæ.* Brilliantly-flowered upright shrubs, in white, pink and red in spring and early summer, the plants not stoloniferous or colonizing: lvs. opposite: fls. 1½ in. long, more or less, borne on short leafy shoots of the season often in more or less compound clusters: fr. long and narrow, woody, dehiscing by 2 valves from the top. Species about 10, in E. Asia. Commonly included in the genus Diervilla, but really distinct. The kinds are much confused by variation, probably by hybridization, so that some of them cannot be referred exactly to botanical species.

The weigelas are hardy bushes adapted to any good garden land if it is not droughty, although they profit by winter protection of the ground. They require no special attention. The bloom arises from twigs of preceding year and therefore should not be trimmed before flowering. Propagated by greenwood cuttings in frames in summer.

amabilis: mostly *W. florida* associate; also a var. of *W. coraeensis.*

arborea: sometimes means *W. coraeensis,* and sometimes a form of *W. florida.*

biformis: *W. florida* associate.

candida: mostly white-fld. *W. florida* associates; *W. hybrida.*

coraeensis. Large stout shrub to 15 ft., distinguished by its glabrous branches and lvs. except that latter may be somewhat pubescent on veins underneath, broad lvs., narrow calyx-lobes separate to base, pale rose to carmine corolla (whitish in var. alba) that is suddenly narrowed below the middle. Japan.

floribunda. To 10 ft.: known by the narrowly funnelform dark crimson fls. crowded on short lateral branchlets and the projecting style and sometimes short-exserted anthers; corolla pubescent outside; calyx-lobes narrow, separate to base: lvs. somewhat pubescent above, more so underneath. Japan.

florida (*W. rosea*). Diffuse nearly glabrous shrub to 8 and 10 ft., with elliptic or obovate short-petioled acuminate lvs. to 4 in. long that are pubescent on veins underneath: fls. broadly funnelform, rose-colored (a white var.), with blunt spreading lobes; calyx-lobes broad and united at or toward base. N. China, Korea. —The commonest weigela in old yards and in many forms of which some depart considerably from the type; some of the named kinds more or less associated with *W. florida* are Biformis, Intermedia, Glorieux, Gustave Mallet, Madame Tellier, Vanhouttei, Venosa, Verschaffeltii, and some of the plants known as Versicolor.

hortensis (*W. japonica* var. *hortensis*). To 10 ft.: young branches hairy and under surface of ovate or oblong acuminate lvs. densely tomentose, upper surface pubescent when young, length 3–4 in.: fls. 3 together on slender peduncle, narrow bell-shaped, carmine (varying to white), style sometimes slightly exserted; calyx-lobes narrow and separate to bottom. Japan.

hybrida. A class name for cultigens that do not conform to diagnoses of the various species, including hort. forms of uncertain origin; some of these vars. are much like *W. florida* and are mentioned in connection with that species. Others are Abel Carrière, André Thouin, Candida, Dr. Baillon, Duchartre, Eva Rathke, Gratissima, Groenewegenii, Hendersonii, Isoline, LaPerle, Lavallei, Lowei, Madame Couturier, Madame Lemoine, Montblanc, Montesquien, Sieboldii, Simondsii, Stelzneri, Styriaca. Forms with variegated lvs. are frequent.

japonica. To 10 ft.: branchlets glabrous or nearly so: lvs. elliptic to long-obovate, to 4 in. long, acuminate, densely pubescent underneath particularly on veins: fls. mostly in 3's on short shoots, rather narrowly bell-shaped, whitish changing to carmine; calyx-lobes very narrow and distinct. Japan.

præcox. To 6 ft.: of the *W. florida* relationship, separated as the earliest flowering: lvs. soft-pubescent underneath: fls. on very short lateral branchlets, calyx-lobes broad and joined below, corolla narrowly bell-shaped and much narrowed below the middle, pubescent outside, rose-colored or pink with yellow in throat. Korea.—Vars. of this species, or to be associated with it, are Avalanche, Bouquet Rose, Conquérant, Daubenton, Espérance, Floreal, Girondin, Gracieux, LePrintemps, Seduction, Vestale.

rosea: *W. florida.*

venusta (*W. florida* var. *venusta*). Handsome, hardy and graceful species, to 5 or 6 ft., with glabrous branchlets and nearly or quite glabrous rather small lvs., distinguished particularly from *W. florida* by its rich rose-purple corolla which is gradually contracted into a slender tube and has short lobes, calyx small and 2-lipped. Korea.

versicolor: *W. floribunda*; sometimes applied to an associate of *W. florida.*

WEINMANNIA. *Cunoniaceæ.* Shrubs or trees mostly of the southern hemisphere, two intro. into Calif.: lvs. opposite, simple or pinnate: fls. in terminal or axillary racemes: fr. a leathery caps.

racemosa. Tree to 80 ft.: lvs. oblong-lanceolate to ovate, to 4 in. long, pinnately 3–5-parted when young, very leathery, coarsely toothed: fls. white or pink, small, in racemes to 4 in. long. New Zeal.

sylvicola. To 50 ft.: lvs. of 3 lfts. or pinnate in young trees, lfts. oblong to lanceolate, to 2 in. long, leathery, coarsely toothed: fls. white or pink, small, in racemes to 4 in. long. New Zeal.

WELLINGTONIA: *Sequoia gigantea.*

WERCKLEA. *Malvaceæ.* One tree native in Costa Rica and planted in S. Calif. **W. insignis.** To 30 ft.: lvs. alternate, orbicular or kidney-shaped, to 16 in. across, bright green, palmately veined: fls. rose-lilac with yellow base, 5 in. across, solitary, on stalks to 6 in. long: fr. a bristly caps. 2 in. long.

WESTRINGIA. *Labiatæ.* Australian shrubs with entire lvs. in whorls and 2-lipped fls. axillary or in terminal leafy heads; one species sometimes grown in S. Calif.

rosmariniformis. To 3 ft. or more: lvs. oblong-lanceolate to linear, to 1 in. long, shining above, silvery-pubescent beneath: fls. white, ½ in. or less long, axillary.

WHEAT: *Triticum æstivum.* **India-**: *Fagopyrum tataricum.*

WHIN: *Ulex.*

WHISPERING BELLS: *Emmenanthe penduliflora.*

WHITE-CUP: *Nierembergia rivularis.*

WHITEWEED: *Chrysanthemum Leucanthemum.*

WHITEWOOD: see *Liriodendron Tulipifera.*

WHITLAVIA: *Phacelia Whitlavia.*

WHITLOW-GRASS: *Draba verna.*

WHITLOW-WORT: *Paronychia.*

WHORL: three or more leaves or flowers at one node, in a circle. **-Flower**: *Morina longifolia.*

WHORTLEBERRY: *Vaccinium.*

WIDDRINGTONIA. *Pinaceæ.* Evergreen trees with scale-like or linear lvs. and cones composed of 4 scales; native in Afr. and Madagascar, suitable for warm countries. Allied to Callitris with which some authorities unite it. For cult. see *Conifers.*

cupressoides. Shrub or small tree to 12 ft.: lvs. scale-like, imbricated: cones ¾ in. or less across, about 3 together. S. Afr.

juniperoides (*Callitris arborea*). Tree to 60 ft.: lvs. scale-like, imbricated: cones ¾ in. across, solitary or several together. S. Afr.

Schwarzii. Similar to *W. juniperoides* but with smaller thicker lvs. and smaller cones. S. Afr.

Whytei (*Callitris Whytei*). Tree to 140 ft.: lvs. imbricated, scale-like, on young plants linear: cones ¾ in. across, 4–6 together. E. Afr.

WIGANDIA. *Hydrophyllaceæ.* Large stout per. herbs, subshrubs or tree-like, with large simple toothed lvs. covered with glistening stinging hairs, and bell-shaped fls. in terminal scorpioid cymes; about 6 species in the mts. of trop. Amer.

Wigandias are grown as foliage plants in subtropical bedding. Propagated by seeds sown under glass in winter or by cuttings of the roots in spring.

caracasana. To 10 ft. or more, sometimes making a large very woody shrub or small tree: lvs. to 1½ ft. long, heart-shaped at base: fls. blue or violet with white tube; filaments hairy below. S. Mex. to Venezuela and Colombia. Var. **macrophylla** has larger lvs.—Cult. in S. Calif. in several forms.

imperialis: a robust form, probably a var. of *W. caracasana.*

macrophylla: *W. caracasana* var.

urens. To 12 ft.: lvs. to 1 ft. long, heart-shaped at base: fls. violet. Peru.

Vigieri: of silvery appearance, perhaps a var. of *W. caracasana.*

WILCOXIA. *Cactaceæ.* Low and weak spiny cacti with dahlia-like roots, 4 species in Tex. and Mex.: branched, often as slender as a lead-pencil, ribs few and low: fls. diurnal, short-tubed, 1 from an areole. See *Cacti.*

Poselgeri (*Cereus* and *Echinocereus Poselgeri* and *tuberosus*). Sts. to 2 ft. high and less than ½ in. thick, ribs 8–10 and inconspicuous and almost hidden by appressed spines, radials 9–12, central 1: fls. purple or pink, 2 in. long. S. Tex., Mex.

WILLEMETIA: *Noltea africana.*

WILLOW: *Salix.* **Desert-**: *Chilopsis linearis.* **Flowering-**: *Chilopsis linearis.* **-Herb**: *Epilobium.* **Primrose-**: *Jussiæa.* **Water-**: *Decodon verticillatus.*

WINDFLOWER: *Anemone.*

WINDOW-GARDENING: see *House Plants.*

WINEBERRY: *Rubus phœnicolasius.* New Zealand: *Aristotelia racemosa.*

WINE-PLANT: *Rheum Rhaponticum.*

WING: a thin, dry or membranaceous expansion or flat extension or appendage of an organ; also the lateral petals of a papilionaceous flower. **-Nut**: *Pterocarya.*

WINTERBERRY: *Ilex glabra, lævigata, verticillata.*

WINTER FAT: *Eurotia lanata.* **-Sweet**: *Acokanthera spectabilis.*

WINTERGREEN: *Gaultheria, Pyrola.* **Flowering**: *Polygala paucifolia.*

WIRE-PLANTS: *Calacinum.* **-Vine**: *Calacinum complexum.*

WISTERIA (*Kraunhia*). *Leguminosæ.* Woody twining vines with pinnate lvs., showy papilionaceous fls. in drooping terminal racemes in spring, and elongated pods contracted at intervals; popular ornamental subjects. *W. floribunda* and *W. sinensis* are the commonly planted species and are hardy N. See p. 8 as to name.

Wisterias thrive in deep rich soil. They do not transplant readily. Propagated by seeds, division, layering, cuttings of ripened wood under glass, root-cuttings over bottom heat, and horticultural forms by grafting.

brachybotrys: *W. floribunda.*

chinensis: *W. sinensis.*

floribunda (*Glycine floribunda. W. brachybotrys*). Japanese W. Lfts. 15–19, ovate-elliptic: fls. violet or violet-blue, to ¾ in. long, in racemes to 1½ ft. long: pods velvety. Japan. Var. **alba** has white fls., var. **rosea** rose-colored or pale pink fls., var. **violacea-plena** double fls. Var. **macrobotrys** (*W. macrobotrys, W. multijuga*) has racemes to 3 ft. long. Var. **variegata** has variegated lvs.

frutescens. Lfts. 9–15, ovate to ovate-lanceolate: fls. lilac-purple, ½ in. long, in racemes to 4 in. long: pods glabrous. Va. to Fla. and Tex.; hardy N.

japonica (*Millettia japonica*). Lfts. 9–13, ovate-lanceolate: fls. white, ½ in. long, in racemes to 1 ft. long: pods glabrous. Japan, Korea; not reliable N.

macrobotrys: *W. floribunda* var.

macrostachya (*W. frutescens* var. *magnifica*). Lfts. usually 9, ovate: fls. lilac-purple or light blue, in racemes to 12 in. long: pods glabrous. Swamps, Ill. to Ark.; nearly or quite hardy N.

magnifica: *W. macrostachya.*

megasperma (*Millettia megasperma*). Evergreen W. Lfts. 7–13, obovate, evergreen: fls. purple, in racemes to 6 in. long: pods velvety. Australia; to be grown in Calif.

multijuga: *W. floribunda* var. *macrobotrys.*

sinensis (*W. chinensis. Glycine sinensis*). Chinese W. Lfts. usually 11, ovate to ovate-lanceolate: fls. bluish-violet, 1 in. long, in racemes to 1 ft. long: pods velvety. China. Var. **alba** has white fls.

venusta. Silky W. Lfts. 9–13, oblong-lanceolate or broader, velvety pubescent on both sides: fls. white, 1 in. long, in racemes to 6 in. long: pods velvety. China; hardy N.

WITCH-HAZEL: *Hamamelis.*

WITHANIA ORIGANIFOLIA: see *Salpichroa rhomboidea.*

WITHE-ROD: *Viburnum cassinoides* and *nudum.*

WITLOOF: see *Chicory.*

WOAD: *Isatis.*

WOLFBERRY: *Symphoricarpos occidentalis.*

WOLFSBANE: *Aconitum lycoctonum.*

WOMANS-TONGUE-TREE: *Albizzia Lebbek.*

WONDERBERRY: *Solanum nigrum.*

WONGA-WONGA VINE: *Pandorea pandorana.*

WOODBINE: *Lonicera Periclymenum, Parthenocissus quinquefolia.*

WOOD-GOSSIP: *Cæsalpinia Nuga.* **-Oil-Tree:** *Aleurites.*

WOODLAND STAR: *Lithofragma affinis.*

WOODRUFF: *Asperula.*

WOODSIA. *Polypodiaceæ.* Small rock-loving ferns with tufted rootstocks and pinnately divided lvs.; sori on veins beneath the indusia, splitting into star-like lobes; native in temp. and cold countries. They are sometimes planted in rock-gardens and similar places. See *Ferns.*

ilvensis. Rusty W. Lvs. to 10 in. long and 1½ in. wide, 2-pinnatifid into oblong wavy-toothed segms. clothed underneath with rusty chaff. Eu., Asia, N. N. Amer.

obtusa. Blunt-lobed W. Common W. Lvs. to 15 in. long and 4 in. wide, 2-pinnate into toothed or cut segms. N. Amer,

scopulina. Rocky Mt. W. Lvs. to 10 in. long and 2 in. wide, 1–2-pinnate into toothed segms., under surface covered with fine white hairs. Mts. of N. Amer.

WOODWARDIA. Chain-Fern. *Polypodiaceæ.* Rather coarse ferns with pinnately divided lvs. and sori in rows parallel to the midrib; native Eu., Asia, N. Amer. Strong plants for outdoor cult. requiring mostly moist places, and a few of them under glass. They present no particular difficulties. See *Ferns.*

angustifolia: *W. areolata.*

areolata (*W. angustifolia. Lorinseria areolata*). Lvs. of two forms, to 15 in. long, 1-pinnate, sterile segms. lanceolate and toothed, fertile linear and entire. Me. to Fla. and La.

Chamissoi (*W. radicans* var. *americana*). Lvs. to 9 ft. long and 1½ ft. wide, 2-pinnate into toothed or lobed segms. B. C. to Calif.

radicans. Differs from the American species in having large buds on the main rachis which root to form new plants. Eu., Asia.

spinulosa. Differs from *W. Chamissoi* in the lower surface having fibrillose scales and the glands stalked. Mex., Guatemala.

virginica (*Anchistea virginica*). Rootstock long and creeping: lvs. to 2 ft. long and 9 in. wide, 2-pinnatifid into oblong or ovate fine-toothed segms. N. S. to Fla. and La., Bermuda.

WOOLLY: provided with long, soft and more or less matted hairs; like wool; lanate.

WOOLLYBUTT: *Eucalyptus longifolia.*

WORMS: *Scorpiurus.*

WORMSEED, AMERICAN: *Chenopodium ambrosioides.*

WORMWOOD: *Artemisia.*

WOUNDWORT: *Anthyllis Vulneraria, Stachys.*

WULFENIA. *Scrophulariaceæ.* Hardy low herbaceous perennials suitable for the rock-garden or the border, with mostly basal toothed lvs. and raceme-like clusters of blue tubular 4-lobed fls.; native Eu. and Asia. Wulfenias need rich moist soil but protection from excessive moisture in winter, as they easily decay. Propagated by seeds or division.

carinthiaca. Lvs. oblong, to 8 in. long: fls. about ⅓ in. long, in dense racemes on scapes to 2 ft. high. Mts. of Carinthiaca.

WYETHIA. *Compositæ.* Per. herbs of W. N. Amer. with alternate mostly entire and elongated lvs. and solitary or few heads of yellow ray- and disk-fls.; pappus a crown. Sometimes transferred to the garden.

amplexicaulis. To 2 ft., glabrous: lvs. oblong to lanceolate, to 1 ft. long, glossy, the upper sessile or clasping: heads bright yellow, the rays 1½ in. long. B. C. to Colo.

angustifolia. To 2 ft., hairy: lvs. lanceolate to oblong-ovate, to 1 ft. or more long, the upper sessile or short-petioled: rays to 2 in. long. Calif.

X

XANTHISMA. *Compositæ.* Ann. or bien. herbs native in Tex., with alternate entire lvs. and solitary heads of yellow ray-fls. blooming in summer; pappus of bristles. Of easy cult. in the border.

texanum (*Centauridium Drummondii*). To 4 ft.: lvs. lanceolate to linear, to 2½ in. long, the lower toothed: heads 2 in. across.

XANTHOCERAS. *Sapindaceæ.* One pleasing deciduous shrub from China, planted for ornament. **X. sorbifolia.** To 15 ft.: lvs. of 9–17 narrow sharply toothed lfts. to 2 in. long, dark green above and paler beneath: fls. polygamous, white with yellow or red blotch at base of petals, nearly 1 in. across, in racemes in May: fr. green, hard and thick-walled, to 2½ in. long, something like a horse-chestnut.—It thrives in any good soil and is hardy N. Propagated by seeds stratified and sown in spring or by root-cuttings over heat.

XANTHORRHIZA: a later spelling of *Zanthorhiza.*

XANTHORRHŒA. *Liliaceæ.* Australian perennials with thick woody often palm-like sts., linear lvs. in a tuft at top of trunk, and fls. in dense spikes at end of terminal scape, the perianth-segms. distinct; suited to dry climates; propagated by offsets.

Preissii. To 15 ft.: lvs. to 4 ft. long and ⅙ in. wide, stiff: spikes 1 in. diam., on scapes to 6 ft. long; stamens to ½ in. long.

XANTHOSOMA. MALANGA. TANIER. YAUTIA. *Araceæ.* Trop. American herbs with thick often tuberous rhizomes, thick arrow-shaped lvs. or sometimes pedately parted, with long petioles, and unisexual fls. borne on densely-fld. spadices which are shorter than the spathes. Grown in the tropics for the edible roots and sometimes also as greenhouse foliage plants.

atrovirens. Lvs. to 3 ft. long and 2 ft. wide, dark green above and gray-green below, glaucous, the petioles to 2 ft. long: spathes about 1 ft. long. S. Amer.

bataviensis: a name of no botanical standing, applied to a plant with purple sts. and dark green lvs.

Lindeni (*Phyllotænium Lindeni*). Lvs. to 1 ft. long, bright green with white veins and midrib, the petioles to 1 ft. long: spathes white, about 5½ in. long. Colombia. Var. **magnificum** is an improved form.

Marshallii is a trade name for a form with green lvs. and dark petioles but is not known botanically.

sagittæfolium. St. to 3 ft. and more high: lvs. to 3 ft. long and nearly as wide, green, the petioles to 3 ft. long: spathes to 9 in. long, greenish-white. W. Indies, S. Amer.

triloba: hort. name.

violaceum. Lvs. to 2 ft. long and 1½ ft. wide, green with usually purplish nerves, paler beneath, glaucous, the purplish petioles to 2½ ft. long: spathes to 1 ft. long, yellowish-white. W. Indies, S. Amer.

XANTHOXALIS: *Oxalis.*

XANTHOXYLUM: variant but not original spelling of *Zanthoxylum.*

XERANTHEMUM. *Compositæ.* Annuals from the Medit. region, with entire lvs. and solitary long-stalked heads of disk-fls., the involucral bracts papery and petal-like, in lilac, rose and purple. One of the oldest and most satisfactory of the immortelles or "everlastings". Propagated by seeds.

annuum. COMMON IMMORTELLE. To 3 ft., white-tomentose: lvs. oblong or oblong-lanceolate, to 2 in. long: heads to 1½ in. across, white, purple, violet, rose. Var. **ligulosum** (*X. imperiale*) is double or semi-double. Var. **perligulosum** (*X. superbissimum*) is very double.

cylindraceum. Gray-pubescent: heads oblong-cylindrical, 12–15-fld.

imperiale: *X. annuum* var. *ligulosum.*

superbissimum: *X. annuum* var. *perligulosum.*

XEROPHYLLUM. TURKEY-BEARD. *Liliaceæ.* Per. herbs with woody rootstocks, linear mostly basal lvs. and white fls. in dense terminal racemes, the perianth-segms. distinct; sometimes transplanted to the wild-garden.

asphodeloides. To 5 ft.: lvs. to 1½ ft. long and 1/12 in. wide: racemes to 6 in. long. N. J. to Fla. and Tenn.

tenax. To 5 ft.: lvs. to 2 ft. long and ⅙ in. wide: racemes to 2 ft. long. B. C. to Calif.

XIMENESIA: *Verbesina encelioides.*

XOLISMA: *Lyonia.*

XYLOBIUM. *Orchidaceæ.* Epiphytic herbs native in trop. Amer., having 1–2-lvd. pseudobulbs and fls. in upright racemes, the sepals and petals nearly similar, the lip 3-lobed. For cult. see *Orchids.*

hyacinthinum (*Maxillaria hyacinthina*). Pseudobulbs with 2 lvs. to 1 ft. long: fls. light yellow, with fragrance of hyacinths, in 15–20-fld. racemes to 7 in. high, July–Aug. Venezuela.

leontoglossum. Pseudobulbs with 1 lf. to 1 ft. long and 3 in. wide: fls. yellow spotted with red, in many-fld. racemes to 1 ft. high, Mar.–Apr. Peru.

XYLOCOCCUS: *Arctostaphylos bicolor.*

XYLOPHACOS: *Astragalus.*

XYLOPHYLLA. *Euphorbiaceæ.* Trop. American shrubs with flattened leaf-like branches, the monœcious apetalous fls. borne in clusters on the edges of the branches, and capsular frs. Often grown as specimen plants under glass for the odd appearance. Propagated by greenwood cuttings.

angustifolia (*Phyllanthus angustifolius*). Shrub to 10 ft.: branches or phyllodia to 4 in. long and ½ in. wide: fls. reddish. Jamaica.

speciosa (*Phyllanthus speciosus. P. latifolius*). Shrub or tree to 20 ft.: branches or phyllodia to 3 in. long and 1 in. wide: fls. whitish. Jamaica.

XYLOSTEON: *Lonicera cærulea* and *utahensis.*

Y

YAM: *Dioscorea*; less correctly, forms of sweet potato. **Cockscomb:** *Rajania pleioneura.*

YAMPEE: *Dioscorea trifida.*

YANGTAO: *Actinidia chinensis.*

YARROW: *Achillea.* **Golden:** *Eriophyllum confertiflorum.*

YATE, FLAT-TOPPED: *Eucalpytus occidentalis.* **-Tree:** *Eucalyptus cornuta.*

YAUPON: *Ilex vomitoria.*

YAUTIA: *Xanthosoma.*

YELLOW-BELLS: *Emmenanthe penduliflora.* **-Root, Shrub:** *Zanthorhiza apiifolia.* **-Tuft:** *Alyssum argenteum.* **-Wood:** *Cladrastis.*

YERBA BUENA: *Micromeria Chamissonis.* **Mansa:** *Anemopsis californica.*

YEW: *Taxus.* **Plum-:** *Cephalotaxus.*

YLANG-YLANG: *Cananga odorata.* **Climbing:** *Artabotrys odoratissimus.*

YOUTH-AND-OLD-AGE: *Zinnia elegans.*

YUCCA. *Liliaceæ.* Bold N. American and W. Indian plants stemless (caudex not above ground) or with woody trunks, having stiff sword-shaped lvs. and white or violet cup- or saucer-shaped drooping fls. borne in mostly erect panicles, opening and fragrant at night, the perianth-segms. distinct or slightly united.

Yuccas are suitable for bold effects in the garden, or the tender kinds under glass in the North; sometimes grown as tub specimens and massed for summer effects. Yuccas require good drainage and prefer sandy loam soil and open exposure. Propagated by seeds, offsets, stem- or root-cuttings. *Y. filamentosa* is the species commonly planted North.; *Y. glauca* is also very hardy.

aloifolia. SPANISH BAYONET. To 25 ft., the trunk simple or branched: lvs. to 2½ ft. long and 2½ in. wide, very sharp-pointed: fls. white, often tinged with purple, to 4 in. across, in panicles to 2 ft. long. S. U. S., W. Indies, Mex.—A form with lvs. yellow or white in center is known as **tricolor** and lvs. yellow margined as **marginata.**

angustifolia: *Y. glauca.*

baccata. To 3 ft., nearly stemless: lvs. 2 ft. long and 2 in. wide, with coarse threads on margin: fls. to 3 in. long. Colo. to Tex.

brevifolia. JOSHUA-TREE. To 30 ft., with trunk to 15 ft.: lvs. to 9 in. long, toothed: fls. greenish-white, to 2 in. long, in heavy panicles 1 ft. or more long. Calif. to Utah.—A striking grotesque tree in many shapes.

coloma: hort. form with small rosettes of blue-green foliage.

constricta. To 5 ft., trunk usually short: lvs. to 2½ in. long and ¼ in. wide, stiff, white-margined and fine fibers: fls. white. Kans. to Tex.

elata (*Y. radiosa*). To 20 ft., with simple or branched trunk: lvs. to ½ in. wide, white-margined: fls. white. W. Tex., Ariz., Mex.

elephantipes (*Y. guatemalensis. Y. gigantea*). To 30 ft., branched above: lvs. to 4 ft. long and 3 in. wide, rough on margins: fls. white or creamy-white. Mex.

filamentosa. ADAMS-NEEDLE. To 12 ft., nearly stemless: lvs. to 2½ ft. long and 1 in. wide, with long curly threads on margins: fls. nearly white, to 2 in. long. N. C. to Fla. and Miss. Var. **variegata** has variegated lvs.

flaccida. Often grown as *Y. filamentosa* but differing in the less rigid habit and the marginal threads being straight. N. C. to Ala.

gigantea: *Y. elephantipes.*

glauca (*Y. angustifolia*). To 6 ft., the short trunk prostrate: lvs. to 3 ft. long and ½ in. wide, margined with white and with fine threads: fls. greenish-white, 2 in. long. S. D. to New Mex.

gloriosa. SPANISH DAGGER. To 8 ft., with short trunk: lvs. to 2½ ft. long and 2 in. across, with stiff point: fls. greenish-white to reddish, 4 in. across. N. C. to Fla.

guatemalensis: *Y. elephantipes.*

Harrimaniæ. To 2 ft., stemless: lvs. linear to spatulate, to 1½ in. wide, with narrow brown margins and white fibers: fls. greenish. Utah to New Mex.

hystrix: *Agave stricta.*

latifolia: listed name.

nobilis: a glaucous form of *Y. gloriosa.*

radiosa: *Y. elata.*

recurvifolia. To 6 ft., the trunk branching: lvs. 2 in. wide, recurving. Ga. to Miss. Var. **variegata** has a central yellow band down lvs.

rupicola. Stemless: lvs. to 1½ ft. long and 1¼ in. wide, glaucous, with yellow or brown margin: fls. white or greenish. Tex.

tenuistyla. To 3 ft., stemless: lvs. to 20 in. long and ½ in. wide, with white margin, mostly recurved. Tex.

Treculeana. To 25 ft., the trunk simple or branched: lvs. to 3 ft. long and 2 in. wide, concave, brown margined: fls. white, to 2½ in. long. S. Tex., Mex.

Whipplei: *Hesperoyucca Whipplei.*

YUCCA, DATE: *Samuela.*

Z

ZALUZIANSKYA (*Nycterinia*). *Scrophulariaceæ.* S. African ann. on per. herbs or subshrubs with the lower lvs. opposite and the upper alternate: fls. long-tubular, the limb 5-lobed, in terminal spikes, especially fragrant toward evening.

Zaluzianskyas are grown for ornament and fragrance, usually from seed sown indoors in early spring or in the autumn and the plants wintered in a coldframe. Those in cultivation are known as flower-garden annuals.

capensis. Night-Phlox. Ann. to 1½ ft.: lvs. linear, to 2 in. long: fls. white inside, purple-black outside and pubescent, to 1¾ in. long.

selaginoides: *Z. villosa.*

villosa (*Z. selaginoides*). Ann. to 1 ft., pubescent: lvs. obovate, to 1 in. long: fls. white or lilac inside, purple outside and nearly glabrous, to 1 in. long.

ZAMAN: *Samanea Saman.*

ZAMIA. *Cycadaceæ.* Fern-like or somewhat palm-like mostly low plants with short or underground tuber-like trunks, pinnate evergreen lvs. and fls. borne in cones and heads; about 40 species in trop. and subtrop. Amer., sometimes planted in the open in warm countries. The width and size of pinnæ (which are without midrib) varies with age and growing conditions, and specific lines are not well understood. For cult. see *Cycas.*

Altensteinii: *Encephalartos Altensteinii.*

floridana. Coontie. Trunk low or underground, tuber-like: lfts. revolute at edges, to 6 in. long and ¼ in. wide. S. Fla.

integrifolia. Trunk to 1½ ft. high: lfts. entire or only slightly toothed toward tip. W. Indies.

Lehmanni: *Encephalartos Lehmanni.*

Loddigesii (*Z. terrestris*). Lfts. finely spiny-toothed from middle to tip. Mex., Guatemala.

pumila. Similar to *Z. floridana* but lfts. to 4 in. long and ½ in. broad. Fla.

terrestris: *Z. Loddigesii.*

villosa: *Encephalartos villosus.*

ZANTEDESCHIA (*Calla* of gardeners. *Richardia*). Calla. *Araceæ.* S. African herbs with thick rhizomes, simple basal lvs. with long petioles, and unisexual fls. borne on spadices which are shorter than the white, yellow or pink showy spathes; popular greenhouse plants and also grown out-of-doors in warm regions. The true Calla is a small herb of northern regions (*Calla palustris*).

For indoor growing, callas do best if they are rested throughout the summer. Bulbs should be planted in rich fibrous soil in 6-inch pots and kept fairly cool until the roots have formed. They may then be given heat, light and plenty of water. After the flowers appear applications of liquid manure may be beneficial. Propagated by offsets from the bulbs. The golden calla may also be propagated by seeds.

æthiopica (*Richardia æthiopica* and *africana*). Common C. To 2½ ft.: lvs. heart- or arrow-shaped, to 1½ ft. long and 10 in. wide, shining green: spathes to 10 in. long, white, the limb flaring outward. Var. devoniensis is a dwarf form. Var. minor grows to 1½ ft. tall and has spathes to 4 in. long.

albo-maculata. Spotted C. Lvs. arrow-shaped, to 1½ ft. long, spotted with white: spathes to 5 in. long, creamy-white, purplish in throat, trumpet-shaped.

devoniensis: *Z. æthiopica* var.

Elliottiana. Golden C. Lvs. ovate-cordate, to 10 in. long and 6 in. wide, bright green with white or translucent spots: spathes to 6 in. long, rich yellow.

Rehmannii. Red or Pink C. Dwarf: lvs. long-lanceolate, to 1 ft. long and 1¼ in. wide, bright green with white or translucent spots: spathes to 5 in. long, rose or red or sometimes nearly white with a rose margin.—For another plant sometimes known as red calla, see *Sauromatum.*

ZANTHORHIZA (*Xanthorrhiza*). *Ranunculaceæ.* One deciduous shrub to 2 ft. with bitter yellow roots, native in E. N. Amer. **Z. apiifolia.** Shrub Yellow-Root. Lvs. 1–2-pinnate, with usually 5 toothed or lobed lfts.: fls. brownish-purple, polygamous, about ⅕ in. across, in drooping racemes to 4 in. long, with 5 petal-like sepals and 5 small petals.—It thrives in shady damp positions, and is a little bush of much interest. Propagated by division of roots and by seeds.

ZANTHOXYLUM (*Xanthoxylum*). *Rutaceæ.* Mostly aromatic prickly shrubs or trees with alternate pinnate lvs., small diœcious or polygamous fls. in cymes or panicles, and fr. of 1–5 carpels; sometimes planted for ornament, some of them bearing the small fls. in advance of the lvs.

The first species (*Z. americanum*) is very hardy and most of the others should thrive in the middle latitudes. Several species have medicinal properties. Propagated by seeds, suckers, and root-cuttings.

americanum. Prickly-Ash. Prickly shrub or tree to 25 ft.: lvs. of 5–11 ovate lfts. to 2½ in. long: fls. greenish, in axillary cymes, before the lvs. Que. to Va. and Neb.

Bungei: *Z. simulans.*

Clava-Herculis (*Fagara Clava-Herculis*). Hercules-Club. Toothache-Tree. Tree to 30 or even 50 ft., with prickly trunk and branches, sometimes bush-like: lfts. 3–9 pairs, closely serrate, petiole and rachis often prickly: fls. in terminal panicles; seeds black and shining. S. Va. to S. Fla., to Tex.

oxyphyllum. Shrub: lvs. of 7–21 ovate-lanceolate or oblong lfts. to 4 in. long: fls. ⅛ in. across, in many-fld. cymes. Himalayas; to be grown far S.

Piasezkii. Shrub to 10 ft.: lvs. of 7–15 ovate or oblong lfts. to 1 in. long: fls. in small cymes. China.

piperitum. Shrub or tree to 20 ft.: lvs. of 7–11 ovate lfts. to 2 in. long: fls. in cymes 2 in. across. China.

schinifolium (*Fagara schinifolia*). Shrub or small tree: lvs. of 13–21 lanceolate lfts. to 1½ in. long: fls. greenish, in cymes 4 in. across. Japan, Korea.

simulans (*Z. Bungei*). Prickly shrub or tree to 25 ft.: lvs. shining, of 7–11 ovate lfts. to 2 in. long: fls. in cymes 2½ in. across. China.

stenophyllum (*Fagara stenophylla*). Shrub climbing to 10 ft.: lvs. of 7–13 ovate to lanceolate lfts. to 3 in. long: fls. in cymes 3½ in. across. China.

ZAUSCHNERIA. *Onagraceæ.* Per. herbs with alternate lvs. or the lower lvs. opposite, scarlet fuchsia-like fls. in racemes, and capsular frs.; useful as a wall cover, in rockeries or the flower-garden. Propagated by division, cuttings or seeds.

californica. CALIFORNIA FUCHSIA. Decumbent or nearly erect, to 2½ ft.: lvs. lanceolate to oblong, to 1¼ in. long, hairy: fls. to 2 in. long. Calif. Var. **microphylla** (*Z. cana*) has linear lvs.

cana: *Z. californica* var. *microphylla.*

ZEA. *Gramineæ.* One large ann. grass comprising many races or strains, supposedly trop. American but of undetermined origin, widely grown for forage, grain and human food. See *Corn.* **Z. Mays.** MAIZE. INDIAN CORN. To 12 ft. or more, suckering at base: lvs. to 3 ft. long and 4 in. wide, curving: staminate spikelets in terminal panicles; pistillate in several rows on a thick rachis or cob, inclosed in large leafy bracts or husks, with long styles or "silk": grains flattened, white, yellow or black. Var. **Curagua** is a robust green-lvd. form grown for ornament. Var. **everta,** POP CORN, has small ears with mostly pointed grains that explode when heated. Var. **gracillima** is dwarf with narrow lvs. Var. **indentata,** DENT CORN, is tall with yellow or white grains indented at top. Var. **indurata,** FLINT or YANKEE CORN, is of medium size with brown-yellow hard smooth grains. Var. **japonica** has foliage longitudinally striped with yellow, white or pink and planted for ornament. Var. **quadricolor** is a form of *japonica.* Var. **rugosa** (var. *saccharata*), SWEET or SUGAR CORN, is rather small with wrinkled sweet grains. Var. **tunicata,** POD CORN, has each kernel inclosed in a husk. Var. **variegata** is a form of *japonica.*

ZEBRA PLANT: *Calathea zebrina.*

ZEBRINA. *Commelinaceæ.* Of the 2 species one is common as an under-bench greenhouse and basket-plant. **Z. pendula** (*Tradescantia zebrina*). WANDERING JEW. Decumbent per. rooting at joints: lvs. ovate-oblong, striped with white above, purple beneath: fls. red-purple, in clusters between 2 boat-shaped bracts of unequal size. Mex. Var. **quadricolor** (*Tradescantia quadricolor* and *multicolor*) has metallic-green lvs. striped with green, red and white.—Propagated by cuttings of the st. It creeps and propagates itself.

ZELKOVA. *Ulmaceæ.* Asian deciduous elm-like trees or shrubs with alternate toothed lvs., unisexual or bisexual fls., and fr. an oblique drupe. Hardy as far north as New England and of easy cult. Propagated by seeds, layers and grafting on the elms.

acuminata: *Z. serrata.*

californica: material under this name appears to be *Z. carpinifolia.*

carpinifolia (*Z.* and *Planera crenata.* *Z. ulmoides.* *Planera Richardii*). To 80 ft.: lvs. elliptic to oblong, to 2 in. long, acute, wavy-toothed, pubescent on veins beneath. Caucasus.

crenata: *Z. carpinifolia.*

cuspidata: *Z. serrata.*

Davidii: *Hemiptelea Davidii.*

Keaki: *Z. serrata.*

serrata (*Z. acuminata.* *Z. cuspidata.* *Z. Keaki.* *Planera japonica*). To 100 ft.: lvs. ovate or oblong-ovate, 2–5 in. long, acuminate, sharply toothed, glabrous beneath. Japan.

ulmoides: *Z. carpinifolia.*

ZENOBIA. *Ericaceæ.* One deciduous or semi-evergreen shrub to 6 ft., native from N. C. to Fla. **Z. pulverulenta** (*Z. speciosa.* *Andromeda pulverulenta* and *A. speciosa*). Lvs. alternate, oval to oblong, to 3 in. long, covered with glaucous bloom: fls. white, bell-shaped, to ½ in. across, in clusters forming terminal racemes, May–June: fr. a caps. ¼ in. across. Var. **nuda** (*Z.* and *Andromeda cassinifolia*) has lvs. without bloom and smaller fls.—It does best in sandy or peaty soil and is also adapted for forcing in the greenhouse. Propagated by seeds, by layers, by cuttings of half-ripened wood or of green wood from forced plants.

ZEPHYRANTHES (*Atamosco*). ZEPHYR-LILY. *Amaryllidaceæ.* Low bulbous herbs with grass-like basal lvs. and funnelform white, yellow, pink or red fls. solitary at end of hollow scape, the perianth-segms. united into short or long tube; stigma in ours mostly 3-branched. Fairly hardy out-of-doors with winter protection, but in regions of heavy frosts the bulbs should be stored in winter.

alba. Fls. pure white; unidentified botanically.

Atamasco (*Amaryllis Atamasco*). ATAMASCO-LILY. To 1 ft.: lvs. narrowly linear, to 1 ft. long: fls. white sometimes tinged with purple, to 3 in. long, in spring. Pa. to Fla. and Ala.

candida. Lvs. linear, thick with obtuse edges, stiff, to 1 ft. long: fls. white sometimes tinged with rose outside, 2 in. long, in summer and autumn; stigma not markedly cleft. LaPlata region, S. Amer.—Sometimes planted as Atamasco.

carinata. Lvs. linear, to 1 ft. long, flat: fls. rose-red or pink, to 3 in. long, in spring and summer. Trop. Amer.

rosea. Lvs. flat, spreading, very obtuse at apex: fls. rose-red, about 1 in. long, in autumn. Cuba.—Plants grown under this name are likely to be *Z. carinata.*

texana. To 8 in.: lvs. narrowly linear, to 4 in. long: fls. yellow, coppery and striped with purple outside, 1 in. long, in summer. Tex.

tubispatha. Lvs. narrow-linear, exceeding slender scapes: fls. white, 2 in. or less long, spring and summer, the spathe sheathing. W. Indies, N. S. Amer.

ZINGIBER. GINGER. *Zingiberaceæ.* Trop. herbs with tuberous aromatic rootstocks which are the source of commercial ginger, leafy sts. and fls. borne under bracts in terminal or lateral spikes, having 1 petal-like staminode or lip.

Ginger should have fertile soil and partial shade and requires tropical temperatures. Of easy cultivation in the greenhouse but should be rested in winter. Propagated by division of the roots in spring. See *Zingiberaceæ.*

Darceyi. To 3 ft.: lvs. to 8 in. long and 2½ in wide, bright green with creamy-white or pink margins and oblique stripes: fls. deep red. Of hort. origin.

officinale. COMMON G. To 3 ft.: lvs. to 1 ft. long and ¾ in. wide: fls. yellow-green, the lip purple spotted with yellow, in dense spikes to 3 in. long. Pacific Isls.

Zerumbet. To 1½ ft.: lvs. to 6 in. long and 3 in. wide: fls. white, the lip pale yellow tinted with orange, in dense spikes to 3½ in. long. India, Malaya.

ZINGIBERACEÆ. Ginger Family. Trop. per. rhizomatous herbs of about 40 genera, characterized by erect cane-like sts. in clumps with elongated entire lvs. and commonly sheathing petioles, irregular bisexual fls. borne under bracts in spikes, heads or panicles, with tubular 3-lobed calyx and corolla, 1 fertile stamen and 1 or more petal-like staminodia, inferior 1-celled ovary, and capsular fr. Species of several genera are grown for the ornamental foliage and others furnish dyes, perfumes, spices, condiments, and medicinal products. Those herein treated are Alpinia, Amomum, Costus, Curcuma, Elettaria, Hedychium, Zingiber.

The culture is simple in the open in tropical and semi-tropical regions; they commonly thrive on lowish ground. Under glass they are mostly planted in the ground or grown in tubs or very large pots. Propagation is by division of the thick rootstocks or subterranean tubers.

ZINNIA (*Crassina*). *Compositæ.* Herbs or subshrubs with opposite and usually sessile lvs. and showy solitary terminal heads, the rays bright colored, the disk in cult. forms nearly or wholly lacking; native in N. and S. Amer., chiefly Mex.

Zinnias are popular in the flower-garden and as cut-flowers. The usual garden soil is satisfactory and full sun or even a semi-shady situation. Propagated by seed sown indoors or outdoors in the spring when the ground is warm enough.

angustifolia (*Z. mexicana*). Differs from *Z. elegans* in the smaller stature, oblong to ovate-lanceolate sessile lvs. and orange heads 1½ in. across. Mex.

elegans. Youth-and-Old-Age. Ann., erect, to 3 ft., hairy: lvs. ovate or oval, clasping: heads to 4½ in. across, rays broad and showy, originally purple or lilac but now of nearly every color except blue and green; disk yellow or orange when present. Mex.

grandiflora. Per. to 8 ft., hairy: lvs. linear, 1 in. long: heads with yellow rays turning white and brick-red disks. Colo. to Tex. and Ariz.—The *grandiflora* of hort. may be only a form of *Z. elegans.*

Haageana: a broad-lvd. form of *Z. angustifolia.*

linearis. Ann. to 1 ft., branching: lvs. linear-lanceolate: heads clear golden-yellow, to 2 in. across, each ray-fl. margined with bright orange. Mex.

mexicana: *Z. angustifolia.*

multiflora (*Z. tenuiflora*). Ann., erect: lvs. ovate or ovate-oblong: heads 1 in. across, rays red or purple, linear. Mex., S. Amer.

pauciflora. Ann., erect: lvs. lanceolate or oblong-ovate: heads 1 in. across, yellow, sometimes with purple or yellow rays in cult. Mex., S. Amer.

tenuiflora: *Z. multiflora.*

verticillata. Robust form of *Z. multiflora* with verticillate lvs. and double series of rays.

ZIT-KWA: *Benincasa hispida.*

ZIZANIA. Wild Rice. *Gramineæ.* Tall ann. and per. grasses inhabiting marshes in N. Amer. and Asia, monœcious, the pistillate spikelets borne in upper part of panicle, the staminate in lower; one species planted along borders of ponds and in pools. See *Grasses.*

aquatica. Ann. to 10 ft.: lvs. to 1 ft. or more long and 2 in. wide: panicles to 2 ft. long, awns to 3 in. long; pistillate lemmas thin and papery. Me. to Fla. and La. Var. **angustifolia** (*Z. palustris*) has lvs. to ½ in. across and tough pistillate lemmas. N. B. to N. Y. and Ind.

palustris: *Z. aquatica* var. *angustifolia.*

ZIZYPHUS. *Rhamnaceæ.* Shrubs and trees, deciduous or evergreen, mostly with stipular spines, alternate simple lvs. strongly mostly 3-nerved from the base, some 40 species in warm and trop. regions of eastern and western hemispheres, a few of them in the Tex.-Mex.-Calif. region: fls. small, greenish, whitish or yellow, in axillary clusters: fr. a fleshy drupe, sometimes edible.

The species are known in horticulture mostly for the fleshy fruits of the jujube, which are preserved, dried, sweet-pickled, stewed, and employed in confections, represented in *Z. Jujuba* and *Z. mauritiana.* The former (as now defined) is a deciduous small tree or large bush with small green serrate leaves, standing as far north as western New York in protected places, and the principal source of jujubes; the latter, from India, is a small tree with nearly or quite entire broad thick more or less persistent leaves that are white- or rusty-felted underneath, hardy only in Florida, southern California and similar climates. There is unfortunate confusion in the names of these two species. The former was known to Linnæus (1753) as *Rhamnus Zizyphus.* Philip Miller, in 1768 established the genus, spelling it *Ziziphus,* and named the plant *Z. Jujuba.* In 1789 Lamarck applied the name *Z. Jujuba* to the other or tomentose evergreen species, the one for which the name *Z. mauritiana* is now held, calling the green-leaved Millerian species *Z. vulgaris*; it is the *Jujuba* plant of Lamarck that has become current in literature, but the *Jujuba* of Miller (representing the Chinese jujube) is an older designation and must stand although it has been generally recognized only recently.

The cultivation of these plants applies primarily to the green-leaved or common Chinese jujube. This tree thrives in hot and dry regions and in lands strong in alkali. It blooms late and thereby usually escapes late spring frosts. It promises well as a fruit-tree in the southwestern United States. Irrigation contributes to the production of abundant large fruits. In orchard plantations trees may be set 20 to 25 feet apart either way. Thus far the jujube is very free in this country from diseases and insects. Propagation is simple by means of cleaned and stratified seeds, but the seedlings are utilized only as stocks if the best fruit is desired. The jujube may also be propagated by means of root-cuttings. Improved varieties are whip-grafted on seedlings, dormant cions being usually employed.

Jujuba (*Z. vulgaris. Z. sativa*). Common or Chinese Jujube. Deciduous tree to 40 ft., sometimes a large bush: lvs. green both sides, ovate to oblong-oval or nearly lanceolate, 1–2 in. long, obtusely serrate; spines usually 2, slender, one of them mostly recurved: fr. oblong to ovoid to subglobose, 1¼ in. or less long. S. E. Eu. to China.—There are many pomological vars., particularly in the Orient.

mauritiana (*Z. Jujuba* of Lamarck). Indian or Cottony Jujube. Shrub or small tree, commonly evergreen: lvs. broad-oval, rounded, to 2½ in. long, the under surface and twigs white- or rusty-tomentose; spines stout: fr. globose or short-oblong, 1 in. or less diam., acid. India; now widely spread in warm countries.—Less developed pomologically than the preceding.

Mistol. To 30 ft., spiny: lvs. oval, 1 in. long, minutely toothed: fr. black, ⅓ in. across. Argentina.

obtusifolia. Much branched spiny stiff shrub: lvs. ovate or rarely oblong, to 1¼ in. long, entire or slightly toothed, glabrous: fr. black, ⅓ in. long. Tex. to Ariz.

sativa: *Z. Jujuba.*

vulgaris: *Z. Jujuba.*

ZOYSIA (*Osterdamia*). *Gramineæ.* Per. creeping grasses with fine close foliage useful for lawns and golf-courses in the S.: lvs. subulate: spikelets borne in spikes. See *Grasses.*

japonica. Korean Lawn-Grass. Differs from *Z. Matrella* in being coarser and lvs. ⅛ in. wide. Japan, China.

Matrella (*Z. pungens*). Manila-Grass. Flowering sts. to 1½ ft. high: lvs. to 3 in. long and 1/12 in. wide, sharp-pointed: spikes to 2 in. long. S. Asia, E. Indies.

pungens: *Z. Matrella.*

tenuifolia. MASCARENE-GRASS. Similar to *Z. Matrella* but with finer thread-like lvs. Mascarene Isls.

ZYGADENUS. *Liliaceæ.* Per. herbs with or without bulbs, having linear lvs. and greenish-white fls. in terminal panicles or racemes, the perianth-segms. often united at base. Occasionally grown in the wild-garden. Propagated by division or seeds.

angustifolius (*Amianthium angustifolium. Tracyanthus angustifolius*). To 3 ft.: lvs. to 1½ ft. long: racemes to 4 in. long. N. C. to Fla.

elegans (*Anticlea elegans*). To 3 ft.: lvs. to 1 ft. long, glaucous: racemes or panicles to 1 ft. long. N. B. to Alaska and New Mex.

Fremontii. To 3 ft.: lvs. to 1½ ft. long and ¾ in. across: racemes simple or compound, to 1 ft. long. Calif. Var. **minor** is smaller with few-fld. raceme.

gramineus (*Toxicoscordion gramineum*). To 14 in.: lvs. to 8 in. long: fls. in short racemes. Sask. to Colo.

leimanthoides (*Oceanorus leimanthoides*). To 4 ft.: lvs. to 1 ft. long: panicles to 1 ft. long. N. Y. to Ga. and Tenn.

muscætoxicus: *Amianthium muscætoxicum.*

ZYGOCACTUS. *Cactaceæ.* One epiphytic species in S. Brazil, much cult. as a window and conservatory plant under the name *Epiphyllum truncatum,* known by its regularly forking growth and irregular fls. See *Cacti.* **Z. truncatus.** CRAB and CHRISTMAS CACTUS. Bushy, much branched, often hanging, glossy joints about 1–2 in. long, flat and sharp-serrate and 2 teeth at apex: fls. horizontal from ends of joints, red.—Much grown under various names and in many colors and forms, most of which are hybrids with other cacti. They propagate readily from cuttings and bloom freely in winter.

ZYGOPETALUM. *Orchidaceæ.* Trop. American epiphytes with 2- or more-lvd. pseudobulbs and rather large fls. in 3–10-fld. racemes or solitary, the sepals and petals similar, the lip 3-lobed with broad spreading midlobe or entire; grown in a warm greenhouse. For cult. see *Orchids.*

Burkei. Pseudobulbs with 2–3 lvs. to 1 ft. long: fls. 2 in. across, in 2–6-fld. racemes to 16 in. high; sepals and petals greenish striped with brown; lip white striped with blue, Nov.–Dec. Guiana.

Burtii: *Huntleya Burtii.*

cœleste (*Bollea cœlestis*). Lvs. to 1 ft. long and 3 in. wide: fls. dark violet, 3½ in. across, with golden-yellow callus, July–Aug. Colombia.

crinitum: *Z. Mackayi* var.

Gairianum. Lvs. to 15 in. long: fls. solitary; sepals and petals violet tipped inside with black-purple; lip rose with 15–17 radiating keels. Ecuador.

Gautieri: *Z. maxillare* var.

intermedium. Lvs. to 1½ ft. long: fls. to 3 in. across, in 5–6-fld. racemes longer than lvs.; sepals and petals green spotted with brown; lip bluish-white lined with purple. Brazil.

Lalindei (*Bollea Lalindei*). Lvs. to 1 ft. long and 1½ in. wide: fls. about 3 in. across, the sepals and petals bright rose darker in upper part, lip and callus bright yellow, July–Aug. Colombia.

Mackaii. Pseudobulbs with 2–3 lvs. to 1 ft. long: fls. fragrant, to 3 in. across, in 5–8-fld. racemes to 1½ ft. long; sepals and petals yellowish-green spotted with purple; lip white marked with purple, Nov.–Feb. Brazil. Var. **crinitum** (*Z. crinitum*) has green fls. spotted brown and wavy hairy lip.

maxillare. Pseudobulbs with 2–3 lvs. to 16 in. long: fls. 1½ in. across, in 6–8 fld. racemes; sepals and petals green spotted with brown; lip purple with large crest. Brazil. Var. **Gautieri** (*Z. Gautieri*) has fls. 3 in. across.

ZYGOPHYLLACEÆ. CALTROP FAMILY. Over 20 genera of trees, shrubs and herbs, with mostly pinnate lvs., bisexual fls. with 4–5 sepals and petals, 8–10 stamens, 2–5-celled ovary and united style, and fr. a caps., often winged. Of little hort. importance in this country, but Guaiacum furnishes the lignum-vitæ of commerce and the trees are interesting and ornamental, and Larrea may be transplanted in its region.

Date Due

Mar 11 '44 Hunter
Jun 26 '45 A J Hanna
23 Sep '47 [illegible]
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JUL 25 1975
JUN 06 1979
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